

Dredging Operations and Environmental Research Program

## Soil Separation Mobile Treatment Plant Demonstration, Bayport Confined Disposal Facility, Green Bay, Wisconsin

Trudy J. Olin-Estes, Susan E. Bailey, David W. Bowman, Dennis L. Brandon

October 2002

20021129 088

The contents of this report are not to be used for advertising, publication, or promotional purposes. Citation of trade names does not constitute an official endorsement or approval of the use of such commercial products.

The findings of this report are not to be construed as an official Department of the Army position, unless so designated by other authorized documents.

## Soil Separation Mobile Treatment Plant Demonstration, Bayport Confined Disposal Facility, Green Bay, Wisconsin

by Trudy J. Olin-Estes, Susan E. Bailey, Dennis L. Brandon
Environmental Laboratory
U.S. Army Engineer Research and Development Center
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

David W. Bowman

U.S. Army Engineer District, Detroit McNamara Federal Building 477 Michigan Avenue Detroit, MI 48226-2575

Final report

Approved for public release; distribution is unlimited

# Dredging: Innovative Technology



Soil Separation Mobile Treatment Plant Demonstration, Bayport Confined Disposal Facility, Green Bay, Wisconsin (ERDC/EL TR-02-38)

**ISSUE:** Confined disposal facilities (CDFs) have historically been used for disposal of both clean and contaminated dredged material from navigational dredging projects. Many CDFs are nearing capacity. Removal of uncomtaminated materials from the CDFs is a viable option for extending the life of these facilities. This approach carries the additional benefit of producing a marketable product for beneficial uses, which can potentially help to offset the cost of processing.

**RESEARCH:** The feasibility of physical separation as a volume reduction method has been demonstrated at several disposal facilities. A guidance document addressing principles of physical separation as they apply to soils and sediments, and identifying standard equipment, selection criteria, and potential sources was recently completed. Technical notes addressing recovery of materials from CDFs were also published under the Dredging Operations and Environmental Research (DOER) program. Work is ongoing at the U.S. Army Engineer Research and Development Center, funded under the DOER program, to develop bench-scale methods for economical preliminary feasibility evaluations.

**SUMMARY:** Preprocessing and separation equipment were tested in a one-day demonstration at Green Bay, WI. A 24-in. (0.6-m) maximum

density separator was used to separate sand from the bulk sediment. The target sand product specifications were less than 10 percent fines by mass and polychlorinated biphenyls (PCBs) concentrations less than 1 mg/kg. The underflow fraction averaged over 92 percent sand, as measured by a Coulter Counter. PCBs were reduced to 0.144 mg/kg PCB 1242 and 0.0119 mg/kg PCB 1260 in the sand, from 2.71 mg/kg and 0.145 mg/kg in the feed material, respectively. Based on statistical analysis of the results, the contaminant concentrations predicted for the sand fraction by the bench-scale testing were essentially equivalent to that achieved in the field operation. Distribution of metals was somewhat more variable than for PCBs, but metals were reduced by a factor of 2.6 to an order of magnitude in the sand fraction.

AVAILABILITY OF REPORT: The report is available in .pdf format on the World Wide Web at: <a href="http://www.wes.army.mil/el/dots/doer/">http://www.wes.army.mil/el/dots/doer/</a> and through Interlibrary Loan Service from the U.S. Army Engineer Research and Development Center (ERDC) Research Library, telephone (601) 634-2355, or the following Web site: <a href="http://libweb.wes.army.mil/index.htm">http://libweb.wes.army.mil/index.htm</a>.

About the Authors: Study Investigators were Mmes. Trudy J. Olin-Estes, Research Civil Engineer, and Susan E. Bailey, Environmental Engineer, Environmental Laboratory, U.S. Army Engineer Research and Development Center; Mr. David W. Bowman, Physical Scientist, U.S. Army Engineer District, Detroit; and Dr. Dennis L. Brandon, Statistician, Environmental Laboratory.

**Point of Contact:** Dr. Robert M. Engler, Program Manager of the Dredging Operations and Environmental Research Program, (601) 634-3624, *Robert M. Engler@erdc.usace.army.mil*.

## Contents

Preface	viii
1—Introduction	1
BackgroundProject Objectives	
Identification of Available Equipment Types and Vendors	
Testing of Candidate Equipment	
2—Project Description	5
Project Activities	5
Field Sampling and Sample Handling	
Characterization and Bench-Scale Testing	
Cell 5 characterization and bench-scale testing	
Cell 4 characterization and bench-scale testing	
Test Candidate Unit	
Site logistics	18
Equipment	18
Field operation	
Visitors	21
Process sampling	
Results	
Particle size analysis	
Percent moisture/percent solids	
Chemical analysis	
Equipment Acquisition	27
3—Conclusions	29
References	30
Appendix A: Coulter Counter Particle Size Analysis, Cell 4 Material	A1
Appendix B: Statistical Analysis of Results	R1

Appendix C:	Chemical Analysis Sample Listing, Data Validation, Raw Data Sheets	C1
SF 298		
List of F	igures	
Figure 1.	Green Bay Bayport CDF	6
Figure 2.	PAH versus oil and grease concentrations, Cell 5 material	12
Figure 3.	PCB versus oil and grease concentrations, Cell 5 material	12
Figure 4.	Metals versus oil and grease concentrations, Cell 5 material	13
Figure 5.	Metals versus TRPH and oil and grease concentrations, Cell 4 material	17
Figure 6.	PCB versus TRPH and oil and grease concentrations, Cell 4 material	17
Figure 7.	PCB versus TOC concentrations, Cell 4 material	18
Figure 8.	MetPro mobile MDS unit	19
Figure 9.	Eductor pump	19
Figure 10.	Powerscreen	20
Figure 11.	Screen undersize	20
List of T	ables	
Table 1.	Green Bay Cell 5 Chemical Analysis of Bulk Sediment, Size, and Density Fractions	10
Table 2.	Particle Size Analysis of Green Bay Cell 5 Samples	11
Table 3.	Particle Size Analysis of Green Bay Cell 4 Samples	14
Table 4	Chemical Analysis of Cell 4 Bulk and Fractionated Sediment Samples	15

Table 5.	Particle Size Analysis of Streams from the Mobile Hydrocyclone Demonstration	24
Table 6.	Percent Moisture and Percent Solids of Process Streams	25
Table 7.	Process Streams Chemical Analysis	26
Table B1.	Sand and Underflow Summary	B4
Table B2.	Sand and Underflow T-Test Results	B5
Table B3.	Sand and Underflow Equality of Variance Test Results	B5
Table B4.	Fines (Silt/Clay) and Overflow Summary	B6
Table B5.	Fines (Silt/Clay) and Overflow T-Test Results	B7
Table B6.	Fines (Silt/Clay) and Overflow Equality of Variances Test Results	B7
Table B7.	Bulk and Feed Summary	
Table B8.	Bulk and Feed T-Test Results	B9
Table B9.	Bulk and Feed Equality of Variances Test Results	B9
Table C1.	Green Bay Physical Separation Samples – ECB Lab ID #s	C2
Table C2.	Data Validation Summary	

## **Preface**

This report summarizes the evaluation of a special hydrocyclone configuration (the maximum density separator) for physical separation of sediments, and corresponding efforts to develop simplified, representative, bench-scale procedures for preliminary testing. This project was jointly funded by the U.S. Environmental Protection Agency Great Lakes National Program Office (GLNPO), GLNPO Identification No. GL98079, IAG 14947887-01, and the U.S. Army Corps of Engineers Dredging Operations and Environmental Research (DOER) Program under Work Unit 0054PD.

This report was prepared by Mmes. Trudy J. Olin-Estes and Susan E. Bailey, Environmental Engineering Branch (EEB), Environmental Processes and Engineering Division (EPED), Environmental Laboratory (EL), Vicksburg, MS, U.S. Army Engineer Research and Development Center (ERDC); Dr. Dennis L. Brandon, Environmental Risk Assessment Branch (ERAB), EPED; and Mr. David Bowman, U.S. Army Engineer District, Detroit, MI. Project manager for GLNPO was Mr. Scott Cieniawski. Mr. Jan Miller, U.S. Army Engineer Division, Great Lakes and Ohio River, served as Corps liaison to GLNPO. Technical review was provided by Dr. Lawrence Jones, OA Systems, and Mr. Mitch A. Granat, U.S. Army Engineer District, Jacksonville, Jacksonville, FL.

The research was conducted under the general supervision of Mr. Daniel E. Averett, Chief, EEB; Dr. Bobby L. Folsom, Jr., Chief, ERAB; and Dr. Edwin A. Theriot, Chief, EL.

At the time of publication of this report, Dr. James R. Houston was Director of ERDC, and COL John W. Morris III, EN, was Commander and Executive Director.

This report should be cited as follows:

Olin-Estes, T. J., Bailey, S. E., Bowman, D. W., and Brandon, D. L. (2002). "Soil separation mobile treatment plant demonstration, Bayport Confined Disposal Facility, Green Bay, Wisconsin," ERDC/EL TR-02-38, U.S. Army Engineer Research and Development Center, Vicksburg, MS.

## 1 Introduction

## **Background**

Confined disposal facilities (CDFs) have historically been used for disposal of both clean and contaminated dredged material from navigational dredging projects where open-water disposal was not permitted. Many CDFs are nearing capacity. Removal of uncontaminated materials from the CDFs is a viable option for extending the life of these facilities. This approach carries the additional benefit of producing a marketable product for beneficial uses, which can potentially help to offset the cost of processing. Use of CDFs as rehandling facilities, with long-term storage for only the most contaminated sediments, is being investigated by the U.S. Army Engineer Research and Development Center (ERDC), in partnership with the U.S. Army Engineer District, Detroit, the Great Lakes National Program Office (GLNPO) of the U.S. Environmental Protection Agency (USEPA), and local port authorities.

The feasibility of physical separation as a volume reduction method has been demonstrated at Saginaw Bay (USEPA 1994), the Erie Pier CDF, Duluth/ Superior Harbor (Olin and Bowman 1996) and Fort Myers, Florida (Granat 1998). Despite successful demonstrations at these locations and continued interest in the technology, physical separation has not yet been implemented as a standard operational practice, with the exception of the Erie Pier CDF. In part, this is due to the lack of internal expertise regarding physical separation and feasibility determinations, the cost of feasibility evaluations, and equipment availability.

A guidance document addressing principles of physical separation as they apply to soils and sediments, and identifying standard equipment, selection criteria, and potential sources was completed (USEPA 1999b). Technical notes addressing recovery of materials from CDFs were also completed under the Dredging Operations and Environmental Research (DOER) program (Olin-Estes and Palermo 2000a,b; Olin-Estes 2000). Work is ongoing at ERDC, funded under the DOER program, to develop bench-scale methods for economical preliminary feasibility evaluations. While bench-scale testing is a necessary first step, the limited volume of material that can be tested with these procedures cannot provide information regarding the potential heterogeneities of large quantities of material. Industry practice is to follow bench-scale testing with evaluation of an intermediate volume of material using a representative unit operation, such as a hydrocyclone. If these results are promising, a preliminary

treatment train is assembled and pilot-scale testing is conducted in the field. Costs to contract intermediate and pilot testing are typically high given that mobilization/demobilization and equipment costs are relatively insensitive to the volume being processed, and most vendors cannot accept contaminated sediments for pilot testing in-house. Availability of a mobile hydrocyclone unit could result in significant cost savings for feasibility evaluations and small-scale projects, and ultimately facilitate full-scale implementation of this technology. The long-term goal is assemble a mobile physical separation plant suitable for separation of sediments and dredged material to serve the Great Lakes CDFs.

Questions remaining to be addressed before full-scale implementation is feasible include the following:

- a. The degree of bulking of residual materials, with and without flocculants, and the short- and long-term effects on CDF capacity recovery.
- b. Alternatives for dewatering residual materials to minimize bulking effects, and their cost, effectiveness, and effect on suitability of residual materials for beneficial uses.
- c. The relative benefit and feasibility of making finer separations (silt/clay) to recover additional material from CDFs.
- d. Evaluation procedures for determining the potential contaminant levels in fine residuals and the effect on the regulatory classification of these materials.
- e. Development of cost/benefit algorithms incorporating all of these considerations for economic feasibility evaluations.

### **Project Objectives**

Identification and purchase of a portable hydrocyclone unit suitable for conducting separation feasibility evaluations and a small-scale field demonstration was the principal objective of this project. While the predominant focus is coarse material recovery for beneficial use as beach nourishment and construction fill (typically requiring the material to contain less than 10-15 percent fines), some beneficial uses will accommodate higher percentages of fine material. The silt/clay separation is expected to be an important long-range objective in maximizing material recovery from CDFs for material in which the silt fraction is substantially less contaminated than the clay fraction. Separation capability at the sand/silt interface (approximately 75 microns) with the additional capability of a silt/clay separation (at 2-3 microns) were therefore the principal operating specifications. Additional criteria were (a) level of expertise required for operation, (b) auxiliary equipment required to support operation, and (c) material preparation required. The equipment may also be used to address other information gaps, as previously described.

## Identification of Available Equipment Types and Vendors

A wide variety of equipment is marketed for size and density separations within the mining industry. However, the equipment is typically designed for coarser and higher density materials. Although there is a significant body of knowledge pertaining to the principles of operation of individual pieces of equipment, there is little guidance in developing a treatment train for processing soils and sediments. Fines, often termed slimes, are considered an operational problem in the mining industry, and are removed as a waste stream prior to making the principal separations. Contaminated sediment separations, however, involve making efficient separations near or within that "waste" fraction, and require the ability to handle and even recover the finest residuals. The condition of the materials presented to the plant will be highly variable, depending upon whether they are consolidated materials excavated from a CDF, or mechanically or hydraulically dredged sediments processed at the time of disposal. In situ water content may vary from 50 to 150 percent, presenting difficulty in handling and in processing through equipment designed for dry (less than 10 percent moisture content), or noncohesive, material. Previous testing of laboratory-scale mining equipment has demonstrated that the feed limitations are not always well defined, and the normal operating parameters may not interface well with the separations of interest for soils and sediments. Even among Architect/Engineer firms with experience in soil washing, assemblage of a treatment train appears to be something of an art, with the configuration varying depending upon specific site conditions. The result is an unacceptable number of operational unknowns for the layman and highly localized expertise within the consulting industry, which ultimately translates to prohibitive cost.

The significant objective of this phase of the project then was to evaluate how the equipment industry has responded to the potential in the sediment remediation arena: identifying the critical core pieces of equipment necessary for the key separations of interest and the minimum necessary auxiliary equipment required in support. The desired outcome is a portable testing unit that (a) is economical to purchase and operate, (b) can be supported with widely available equipment, (c) is adaptable to operational conditions and constraints at different facilities, and (d) is technically simple, operable by field personnel with a reasonable amount of preliminary instruction and technical support.

#### **Testing of Candidate Equipment**

The core unit to be evaluated under this project was a hydrocyclone separator. Performance factors for the equipment considered for demonstration and purchase were as follows:

- a. The experience of the offeror in conducting size separation studies with dredged material and/or soil.
- b. Suitability of the equipment to separate sediment/soil at the 75-μm target size cutoff.

Chapter 1 Introduction 3

- c. Capability to produce a dewatered coarse product.
- d. Suitability of the equipment to handle a variety of sizes and types of dredged material.
- e. Portability of the unit.
- f. Capacity of the unit.
- g. Cost of the unit.
- h. Cost of the demonstration.
- i. Auxiliary equipment and site preparation requirements and costs.
- j. Technical expertise required for operation.
- k. Compatibility of equipment capacity with available storage area, water handling capability, and material preparation and feed capability at the demonstration site.

Preparation and auxiliary equipment requirements, adaptability, and technical expertise requirements were all relatively readily determined from product/offeror information and equipment design. Feed sensitivity and separation efficiency are best evaluated based on a performance test. It was anticipated that potential operational difficulties in this application and considerations of scale and logistics should come to light as a result of the demonstration. Samples were to be taken over a reasonable operating period to permit an assessment of the efficiency of the unit in making the desired separation, response to feed variations (if any), and the variability of the product material. A successful test would meet the separation criteria in a dewatered product, with a minimum of operational problems, at the specified efficiency. For the proposed demonstration, the specified cut point was 75  $\mu$ m, with no more than 10 percent fines (percent by weight passing a No. 200 sieve) in the underflow.

## 2 Project Description

The Bayport CDF in Green Bay, WI (Figure 1), was selected as the field demonstration site. Green Bay is located on the eastern shoreline of Wisconsin, on Lake Michigan. Approximately 115,000 cu m (150,000 cu yd) of sediment are dredged annually, to maintain the 29-km- (18-mile-) long shipping channel in the Port of Green Bay. The Bayport disposal facility was filled to design capacity in the early 1970's. Brown County sought and received authorization to dispose of additional dredged material there. Current operations involve mechanical dredging, with transport and offloading at the CDF by truck. To extend the life of the facility as long as possible, material is periodically removed from the facility, following a period of dewatering. The facility is divided into separate cells to permit offloading, dewatering, excavation, and stockpiling to occur concurrently. The Brown County Port Authority has taken an active interest in innovative management alternatives for dredged material, and the Bayport CDF was also recently the site of a biotreatment demonstration.

### **Project Activities**

ERDC physical separation equipment available for demonstration/testing support was inventoried and its operational status verified. Response to an advertisement for technical support in identification of equipment alternatives and sources and development of a basic treatment train was limited (one firm responded) and exceeded the project budget for this task area. An extensive inhouse effort was therefore initiated to locate off-the-shelf equipment, and to identify those firms with interest in conducting a small demonstration and with availability of suitable scale equipment for preliminary field evaluation. Of the vendors contacted, only two indicated an interest in bringing equipment onsite for a small-scale demonstration: Tri-Flo Industries, Ltd., of Conroe, TX, and MetPro Supply, Inc., of Bartow, FL. Only one, MetPro Supply, responded to the advertisement for bids.

Tri-Flo Industries manufactures mobile, self-contained, fluid-processing equipment. Initially targeting the drilling industry, hydrocyclones mounted in series to a prefabricated header can be purchased, as well as complete, mobile, micro-fluid systems (MFS) designed for drilling mud recovery. These systems include a sump, mud "guns" for maintaining sediment in suspension, a shaking screen, hydrocyclones, and pumps. The configuration appears to have potential for sediment separation, but prescreening of gross oversize and slurrying of consolidated material would likely be needed to utilize the equipment as

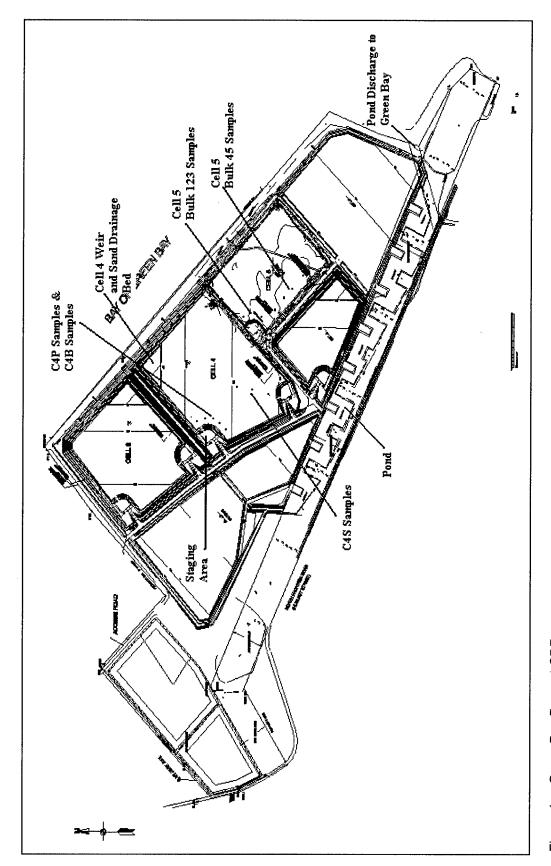


Figure 1. Green Bay Bayport CDF

presently equipped. One advantage to the configuration was the potential for making the sand/silt separation on the screen, followed by a finer cut at the hydrocyclones, thus addressing both size separations of principal interest with one unit. Tri-Flo also manufactures a mud pump that could be useful for excavating and slurrying consolidated material. The mud pump is equipped with an integral screen that prevents the pump from picking up oversize particles. Principal limitations of the equipment were the potential for blinding of the screens, the inability of screens to separate coarse organic materials from coarse minerals, and the fact that this equipment has not been demonstrated for dredged material or sediments.

MetPro Supply manufactures a self-contained maximum density separator (MDS) consisting of a trailer-mounted sump, slurry pump, and MDS. Both 0.15-and 0.3-m (6- and 12-in.) MDS have been demonstrated on sediments in the U.S. Army Engineer District, Jacksonville. Based on previous testing, MetPro recommended a 0.61-m (24-in.) MDS to produce a coarse fraction with less than 10 percent fines entrained. A 0.61-m (24-in.) MDS has a throughput of approximately 4.5 cu m (1,200 gal) per minute (approximately 68,039 kg (75 tons) solids per hour), and can accept particles up to 25-38 mm (1 – 1-1/2 in.) in diameter, thus simplifying prescreening. Dry or slurried material could be fed to the sump, with adjustments to the volume of makeup water supplied. The MDS differs from a conventional hydrocyclone in that a flexible sleeve is attached to the apex of the cone, and a vacuum is applied to the overflow line, thus restricting discharge of underflow until sufficient weight accumulates to force discharge. This reportedly results in a higher solids underflow.

Because of the potential variability in feed requirements, the offerors were tasked with providing the necessary auxiliary equipment to support the proposed separation unit, in effect developing a compatible treatment train. Mechanical excavation and prescreening were to be handled by the Detroit District. Auxiliary equipment was located in the Green Bay/Milwaukee area. A powerscreen for prescreening material; water supply pump; flexible, quick-coupling water hoses; and generator were available and obtained as short-term rentals.

Because the target separation of the proposed equipment was 75 µm, it was necessary to locate material containing sufficient sand to permit evaluation of the efficiency of the equipment in making this separation. Based on anecdotal information, Cell 5 was initially identified as containing sandy material from the outer harbor. Core and near-surface bulk samples were taken from Cell 5 for evaluation. However, finer material had apparently been placed over the target material, and the near-surface dredged material contained little sand. Additional samples were therefore taken for evaluation from Cell 4, where additional coarse material had recently been placed. (This material was from an inner harbor dredging project, and may not be representative of outer harbor sandy sediments). Sampling, sample handling, and bench-scale testing are further detailed in subsequent sections of this report. Approximately 380 cu m (500 cu yd) were

<sup>&</sup>lt;sup>1</sup> Dean Haen, Personal Communication, 5 November 2001, Port Manager, Brown County Port and Solid Waste Department (Port of Green Bay), Green Bay, WI.

also excavated from Cell 5 for evaluation of material handling properties and effects of debris on ease of excavation as part of a cooperative effort funded under the DOER program. Some of this material was processed through the powerscreen to evaluate performance of a dry screen with wet of optimum material, and to evaluate the feasibility of feeding the hydrocyclone using mechanical excavation and prescreening. A smaller volume of material was excavated from Cell 4 for comparative processing through the screen. The remainder of the Cell 4 excavation was accomplished hydraulically, at the time of the demonstration.

## Field Sampling and Sample Handling

Nineteen 25.4-mm- (1-in.-) diameter cores were taken from Cell 5 of the Bayport CDF (Figure 1) to assess moisture content of the material initially proposed for processing. The cores were taken from along the truck dump and the south dike, areas accessible for mechanical excavation, using an AMS Soil Core Sampler with slide hammer, including stainless steel soil collector, and 25.4- by 0.6-mm (1- by 24-in.) butyrate plastic liners with polyethylene caps. (Although 0.6-m (24-in.) tubes were used, in many cases only 0.15-0.5 m (6-18 in.) of dredged material was recovered due either to the compressibility of the material or the inability to drive the sampler deeper.) Five 19-L (5-gal) samples intended for bulk sediment chemistry and fractionation testing were taken along the same perimeter and placed in high-density polyethylene (HDPE) buckets, using a shovel decontaminated with acetone and distilled deionized (DDI) water between samples. Each bucket was placed in a cooler and packed in ice for shipment. Chain-of-custody forms were placed inside the coolers and coolers were sealed with tape and chain-of-custody seals. Chain-of-custody seals were intact upon receipt at the laboratory. Temperatures of the samples upon arrival were below 4 °C (1.7 to 3.3 °C), with the exception of Bucket 4, which was 5 °C. Core samples were not intended for chemical analysis and were therefore not refrigerated. They were left in the disposable plastic liners and shipped together in a cooler for later extrusion.

Before samples were taken from Cell 4, representative material was screened in the field to verify the presence of sand. Based on the field screening, the Cell 4 material along the northwest truck dump was roughly estimated to contain 40 – 50 percent sand. Samples were subsequently taken for laboratory analysis along the northwest truck dump (adjacent Cell 2), and along a radius from the southwest truck dump (adjacent Cell 5 and the road) toward the outlet. Because this was a duplicate effort, a repeat full-scale sampling effort was not feasible. Smaller sample volumes were therefore obtained during a subsequent site visit and progress meeting.

Twelve 0.9-L (1-qt) glass jars were obtained from Cell 4: three for bulk chemical analysis (C4B1-C4B3), six for particle size analysis (C4P1-C4P6) from the perimeter of the northwest truck dump, and three (C4S1-C4S3) for particle size analysis along the inner radius. Sample preservation and chain of custody were observed as for the Cell 5 samples.

#### **Characterization and Bench-Scale Testing**

#### Cell 5 characterization and bench-scale testing

The three 19-L (5-gal) samples taken from along the truck dump were mixed together (Buckets 1, 2 and 3 identified hereafter as Bulk 123 composite) and homogenized. The two 19-L (5-gal) samples taken along the dike (Buckets 4 and 5 identified as Bulk 45 composite) were also combined and homogenized. Wet chemistry, moisture content, and particle size distribution were evaluated on both composites. Because these parameters were relatively comparable for the two composites, one was selected for fractionation testing, rather than compositing the total volume. Bulk 123 was selected because of the greater accessibility of the area from which those buckets were taken, and the greater likelihood that they would be excavated. The cores were extracted from the plastic tubes, and samples were taken for water content analysis.

**Particle size analysis.** Subsamples of the Bulk 123 and Bulk 45 composites were analyzed on the Coulter particle size analyzer. Both composites contained over 90 percent fines.

**Bulk sediment chemistry.** The Bulk 123 composite and Bulk 45 composite were analyzed for polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), metals, total organic carbon (TOC), total recoverable petroleum hydrocarbons (TRPH), and oil and grease (O&G) (the latter three being potential indicator compounds). Results are summarized in Table 1. Concentrations were comparable for all analytes for both composites.

Water content analysis. The core samples (44 total) were analyzed in duplicate for water content ( $w = (M_{water}/M_{solids})*100$ ) by oven drying. The average water content was  $112.4 \pm 24.6$  percent. Water content of the Bulk 123 and Bulk 45 composites averaged 98.7 and 82.2 percent, respectively.

Fractionation testing. Approximately 10.5 kg (wet weight) of the Bulk 123 sample was wet sieved through a 75- $\mu$ m sieve for analysis of the sand (>75  $\mu$ m) and fines (< 75  $\mu$ m) fractions. The resultant slurries were centrifuged and the solids retained for particle size and chemical analysis. Both fractions were analyzed on the Coulter LS100 Particle Size Analyzer to determine the efficiency of the separation. The results (Table 2) show that the fines were not very effectively removed from the sand. Further separation of the clay and silt from a subsample of the fines was attempted using an upflow column. The clay was never effectively removed from the fines, and the samples were therefore not further analyzed.

Additionally, a subsample of the Bulk 123 was fractionated by density using heavy media separation in order to analyze the contaminant differences between mineral and organic sediment material. In this procedure, the sediment was combined with a solution of sodium polytungstate at a specific gravity of 2.0. The mixture was briefly sonicated and then centrifuged to separate the density fractions. The material heavier than 2.0 specific gravity (mineral) sank to the bottom, and the lighter fraction (organic) floated on top of the solution and was

Table 1 Green Bay Cell 5 Chemical Analysis of Bulk Sediment, Size, and **Density Fractions Bulk Sediment** Size Fractions **Density Fractions** Composite Composite <75 μm >75 µm >2.0 sp.gr. <2.0 sp.gr. Description 45 123 (Fines) (Sand) (Mineral) (Organic) **Indicator Analytes** 44833 48567 41300 38900 27800 47700 TOC, mg/kg 147 1030 67 640 O&G, mg/kg 213 210 106.5 TRPH, mg/kg 78 106 525 54 350 <4 TVS, % <4 Metals, mg/kg 2.95 3.29 3.55 1.8 2.99 AS 3 CD 0.939 0.825 1.11 0.669 1.94 1 CR 53.33 52 47.05 50.65 41.3 85.2 CU 48.93 52 43.85 72.7 27.3 97.2 РΒ 58.3 76.8 40.9 68.8 64 51 HG 1.017 1.0345 0.625 1 1.44 2.2 ΝI 20.53 22 19.85 17.2 17.2 17.4 SE 1.06 1 0.95 1.55 0.599 0.998 AG 0 0.45 0.4 0.599 0.53 0.3 154 ΖN 142.7 143 145.5 91.5 128 ВА 81.70 83 77.95 57.65 70.7 73.5 FE 16300 16300 15500 10750 14600 7850 MN 442 485 436 832 382 434 MO 0.2 0.265 0 0.3 0.4 0.699 PCBs, µg/kg PCB-1016 <22.5 <24.5 <24.5 <29.7 <27.1 <15.8 PCB-1221 <29.7 <22.5 <24.5 <24.5 <15.8 <27.1 PCB-1232 <22.5 <24.5 <24.5 <29.7 <15.8 <27.1 1307 1161 970 1742.5 351 3278 PCB-1242 <24.5 <29.7 <27.1 PCB-1248 <22.5 <24.5 <15.8 <22.5 <29.7 <15.8 <27.1 PCB-1254 <24.5 <24.3 39.95 77.9 27.3 PCB-1260 49.5 52.3 111 PAHs, µg/kg NAPHTH 125 165.3 85.95 367 29.9 513 41.2 <6.4 **ACENAY** 9.0 10.0 <20 43.4 ACENAP 14.3 21.6 61.85 <6.4 72 11 27.75 123 10.8 169 **FLUORE** 36.2 42.5 PHENAN 220 269.3 176 877 70 1180 215 29.2 193.5 10.2 ANTRAC 39.8 49.7 FLANTHE 309 388.0 260.5 1130 99.9 1690 **PYRENE** 301 391.7 240 1360 82.1 1570 (Continued)

Table 1 (Concluded)						
	Bulk Sediment Size Fractions		Density Fractions			
Description	Composite 45	Composite 123	<75 μm (Fines)	>75 μm (Sand)	>2.0 sp.gr. (Mineral)	<2.0 sp.gr. (Organic)
		PAHs, µg/kg	(Conclud	ed0		
CHRYSE	192	247.7	152	850	66.2	992
BAANTHR	139	180.3	97.95	756	29.9	720
BBFLANT	127	173.3	112.5	565	53.4	762
BKFLANT	101	139.0	76.35	463.5	32.4	521
BAPYRE	149	193.3	108.45	769	35.6	747
I123PYR	122	164.3	99.45	540	39.4	637
DBAHANT	26.6	29.2	19.5	114	5.1	105
B-GHI-PY	149	179.3	112.5	614	48.3	678
2MeNAPH	130	157.7	98.95	426	31.8	574

Table 2 Particle Size Analysis of Green Bay Cell 5 Samples						
Volume, %	Bulk 45	Bulk 123	Sand	Fines		
< 5 µm	27.1	24.3	5.88	30.5		
< 75 μm	93.3	90.8	43.5	99.98		
> 75 µm	6.70	9.2	56.5	0.02		

removed. The procedure was repeated several times to ensure a reasonably clean separation, as determined by visual inspection.

The four fractionated samples (fines, sand, mineral, organic) were analyzed for PAHs, PCBs, metals, and indicator analytes. Density (mineral and organic) samples were also analyzed for total volatile solids (TVS) to assess efficiency of separation, but this parameter was ultimately not useful, being less than the detection limit (DL) for both fractions. Results are summarized in Table 1.

The contaminant concentrations among the sand and fine fractions display trends opposite of that expected. The sand fraction is typically assumed to be relatively clean, and the fines to contain higher contaminant levels due to higher surface area and clay chemistry. Here, however, PAH and PCB concentrations in the sand exceed that of the fines, many by an order of magnitude. Most metal concentrations (arsenic, cadmium, chromium, copper, lead, mercury, selenium, manganese, molybdenum) were also higher in the sand than in the fines, but within the same order of magnitude. During wet sieving, an oily film was noted to settle on top of the sieved sand. It was thought that much of the contamination could be associated with this film, or with a coarse organic fraction. To evaluate this, the correlation coefficient was calculated for oil and grease and TOC concentrations versus PAH, PCB and metal concentrations. The resulting values indicate a strong linear relationship between oil and grease and PAH

concentrations, and a moderate relationship between oil and grease and PCBs and metals concentrations (Figures 2, 3, and 4), with the exception of selenium and manganese, which evidenced a strong linear relationship. PAH versus PCB concentrations were quite strongly linear. The correlation coefficient for TOC versus PAH, PCBs, and metals indicates a moderate to weak linear relationship. Note that this does not imply that there is not a strong relationship, simply the absence of a strong linear relationship.

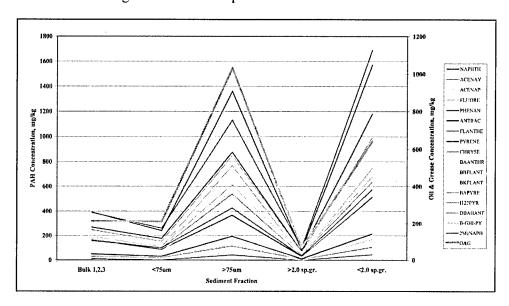


Figure 2. PAH versus oil and grease concentrations, Cell 5 material

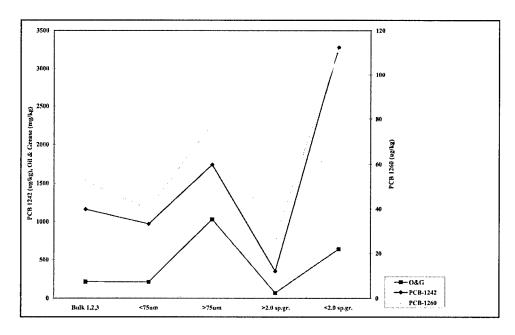


Figure 3. PCB versus oil and grease concentrations, Cell 5 material

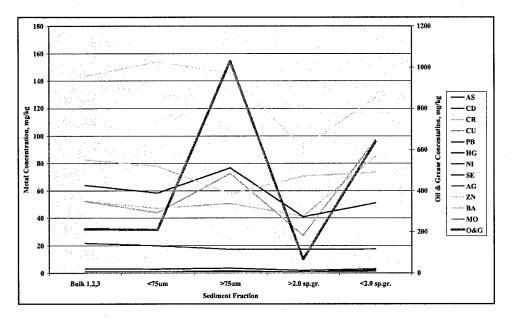


Figure 4. Metals versus oil and grease concentrations, Cell 5 material

The contaminant differences between the mineral and organic fractions were as expected, revealing order of magnitude greater PAH and PCB concentrations in the organic fraction. Metals were not as clearly distributed. Although higher concentrations of metals were present in the organic fraction, they were at the same order of magnitude as in the mineral fraction. Iron was an exception to this, being an order of magnitude higher in the mineral fraction than in the organic fraction. On average, metal concentrations were twice as high in the organic as in the mineral fraction (excluding iron), and PAHs and PCBs in the organic fraction averaged 18 and 7 times, respectively, that of the mineral fraction.

#### Cell 4 characterization and bench-scale testing

**Particle size analysis.** Samples C4P2, C4P4, and C4P6 were analyzed on the Coulter particle size analyzer to verify that a significant sand fraction was present. Percent greater than 75  $\mu$ m was approximately 40, 54, and 62 percent, respectively (by volume). Coulter analysis of the homogenized C4B samples indicated approximately 32.8 percent > 75  $\mu$ m. The samples taken from along the inner radius C4S1-3 were also analyzed on the Coulter, with the volume percent less than 75  $\mu$ m ranging from 96.5 to 99.6 percent, indicating that particular area would not be a good candidate for sand recovery. Output from the Coulter for the C4B samples is presented in Appendix A. Particle size analysis results are given in Table 3.

Table 3 Particle Siz	e Analysis c	of Green Bay C	Cell 4 Samples	
Volume, %	C4P2	C4P4	C4P6	C4B
< 5 µm	15	13	10	20
< 75 µm	60	46	38	67.2
> 75 µm	40	54	62	32.8

Bulk sediment chemistry. The C4B1, C4B2, and C4B3 samples were homogenized, and two samples were then taken for bulk chemical analysis. The average concentrations for the composite are reported in Table 4. The analysis revealed the existence of some PAHs and metals, and concentrations of 3,755 and 39  $\mu$ g/kg, respectively, for PCB 1242 and PCB 1260.

**Water content analysis.** The water content of the C4P2, C4P4, and C4P6 samples was measured in duplicate by oven drying. The water contents averaged 59, 36, and 27 percent, respectively, for the three samples.

**Fractionation testing.** Although a full size and density separation was desired on the Cell 4 material, due to time constraints the most important separation to evaluate initially was the sand/silt separation at 75 µm. This separation was achieved by wet sieving a subsample of the material through a 75-µm sieve. The sand fraction was washed off the sieve, and the wash water was then drained off the sand. The sand sample was analyzed with the Coulter LS100 Particle Size Analyzer and was found to contain only 5.5 percent <75 μm and 1.1 percent < 5 μm by volume, indicating a relatively clean separation. Half the fines slurry was flocculated using Hychem, Inc., CP626 cationic polymer. Two (duplicate) samples from both the dewatered sand and flocculated fines (silt/clay) samples were analyzed for chemical constituents as summarized in Table 4. The other half of the fines fraction was reserved for further fractionation testing. The unflocculated silt and clay fractions were separated using a 50-mm (2-in.) hydrocyclone and the fractions analyzed for PCBs and indicator analytes. The silt and clay fractions were analyzed on the Coulter to evaluate effectiveness of the hydrocyclone separation. Approximately 5.7 percent of the silt fraction was greater than 75 µm, and approximately 14 percent less than 3 µm. The presence of particles greater than 75 µm in the silt fraction can be attributed to oblong particles that pass through the #200 sieve, and agglomeration of particles, which the Coulter may read as a single, larger particle. The clay fraction was less clean, with a mean particle size of 15.24 µm, and a median particle size of 6.39 µm. Approximately 90 percent of the clay fraction was less than 36 µm, and 50 percent less than 6.4 µm. Only 25 percent was less than 2.7 µm. The silt and clay fractions were also subsequently analyzed for chemical constituents (Table 4).

Unlike the Cell 5 analysis, the Cell 4 data follow the expected trends, with greater concentrations of the contaminants associated with the fines than with the sand. Concentrations of metals in the silt/clay fraction are almost all one to two orders of magnitude higher than in the sand. PCBs are an order of magnitude higher in the silt/clay fraction than in the sand. Differences in concentrations

Table 4 Chemical Analysis of Cell 4 Bulk and Fractionated Sediment Samples **Size Fractions** Clay Silt/Clav Silt Sand **Bulk Sediment** (>75 µm) (<75 µm) (≈5 µm - 75 µm) (<5 µm) Avg. Conc. Analyte Avg. Conc. Avg. Conc. Avg. Conc. Conc. **Indicator Analytes** 27300 9180 78900 1435 21100 TOC, mg/kg 475 110 320 220 O&G, mg/kg 43 10.5 J<sup>1</sup> 180 TRPH, mg/kg 270 46 185 TVS, % <4% Metals, mg/kg AS 0.45 5.05 6.85 2.2 CD 0.04 1.355 0.32 2.29 0.6045 CR 3.05 79.95 15.1 134 29.8 32.8 CU 10.05 75.25 21.2 113 РΒ 101.2 242 193.5 43.7 5.6 HG 0.02 3.45 0.363 2.85 1.085 ΝI 27.1 7 10.8 2.2 36.9 SE <0.200 1.1 0.3 1.3 0.4995 0.8995 0.4 0.4995 AG 0.4 1.6 ΖN 320 76.1 13.5 148.555 681 ва 4.6 104.5 27.5 183 42.85 FΕ 10500 30600 3822.4 MN 44.25 325.5 174 321 140 МО <0.100 0.849 0.5 0.3495 1 PCBs, µg/kg PCB-1016 <10.3 <38.9 <11.2 <40.5 <12.7 <10.3 <38.9 <11.2 <40.5 <12.7

PCB-1260	21.4	317.5	18.2	238	39
		PA	Hs, μg/kg		
NAPHTH	*2	*	*	*	123.5
ACENAY	*	*	*	*	14.2
ACENAP	*	*	*	*	41.25
FLUORE	*	*	*	*	53.4
					(Continued)

<11.2

<11.2

<11.2

1950

<40.5

<40.5

<40.5

7595

<12.7

3754.5

<12.7

<12.7

Indicates estimated concentration for analyte that is above MDL but below LRL.

<38.9

5927.5

<38.9

<38.9

PCB-1221

PCB-1232

PCB-1242

PCB-1248

PCB-1254

<10.3

444

<10.3

<10.3

<sup>\*</sup> Due to budgetary constraints, fractionation testing was limited to PCBs and metals, which were thought to be of greatest concern. There was insufficient silt sample for duplicate analysis; results given are therefore based on analysis of only one sample.

Table 4 (C	oncluded)			, , , , , , , , , , , , , , , , , , , ,	
		Size F	ractions		
	Sand	Silt/Clay	Silt	Clay	
Analyte	(>75 μm)		(≈5 μm - 75 μm)		Bulk Sediment Avg. Conc.
Allalyte	Avg. Conc.	Avg. Conc.	Conc.	Avg. Conc.	Avg. Conc.
		PAHs, μg/kg	g (Concluded)		
PHENAN	*	*	*	*	228.5
ANTRAC	*	*	*	*	46.55
FLANTHE	*		*	*	217
PYRENE	*	*	*	*	263
CHRYSE	*	*	*	*	148
BAANTHR	*	*	*	*	125
BBFLANT	*	*	*	*	85.1
BKFLANT	*	*	*	*	73.4
BAPYRE	*	*	*	*	117.5
I123PYR	*	*	*	*	82
DBAHANT	*	*	*	*	15.45
B-GHI-PY	*	*	*	*	95.55
2MeNAPH	*	*	*	*	145.5

between the silt fraction and the clay fraction are not as consistent, but concentrations in the clay fraction are higher for all analytes tested. TOC in the clay fraction is approximately 8.5 times that in the silt. Oil and grease, TRPH, PCB-1242, and PCB-1260 in the clay fraction are 2.9, 3.9, 3.9 and 26 times greater, respectively, than in the silt. Based on correlation coefficients, there is a strong positive correlation between metals concentrations and oil and grease and TRPH concentrations (Figure 5). Metals are moderately correlated to TOC concentration. There is also a moderate to strong positive correlation between PCBs, TRPH, and oil and grease (Figure 6) and PCBs and TOC (Figure 7).

#### **Test Candidate Unit**

A 1-day field demonstration was scheduled for 10 August 2000 at the Bayport CDF, Green Bay, WI. Equipment arrived onsite on Monday, 7 August 2000. Three full days were required to set up the system. This was not sufficient time to debug and troubleshoot, however; a cold start was made on the day of the demonstration. An electrical problem, unrelated to the separation unit, caused a minor delay. The system ran intermittently after that, with additional delays for clearing the jet pump and replacing or tightening clamps on water supply or slurry delivery hoses. The system was operated for approximately 5 hours, at which time sufficient material had been processed to assess the separation efficiency, and overall system characteristics and trouble points had been identified.

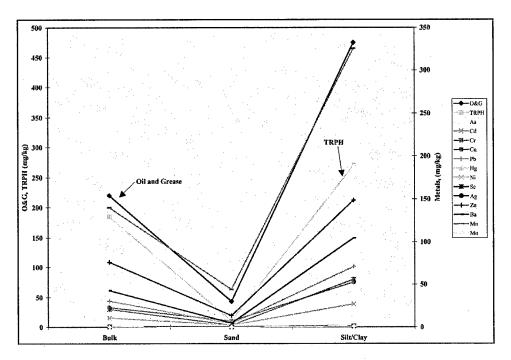


Figure 5. Metals versus TRPH and oil and grease concentrations, Cell 4 material

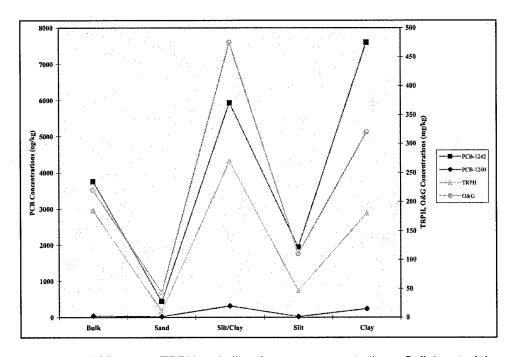


Figure 6. PCB versus TRPH and oil and grease concentrations, Cell 4 material

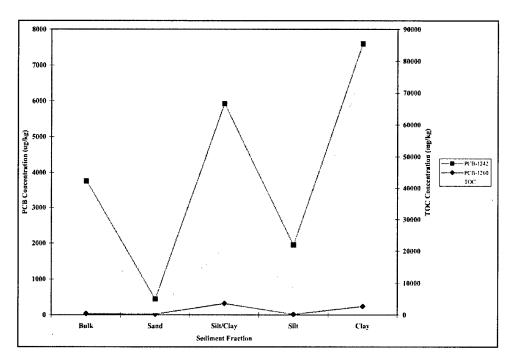


Figure 7. PCB versus TOC concentrations, Cell 4 material

#### Site logistics

The Cell 4 staging area was much farther from the freshwater source than the staging area originally selected for processing the Cell 5 material. Additionally, the Cell 4 staging area was much smaller than the original site, making onsite stockpiling of mechanically excavated material infeasible. It was therefore decided to excavate only a small amount of Cell 4 material for screening testing, and to excavate feed for the hydrocyclone using a modified jet pump. This was a particularly attractive alternative because of the potential benefits of small-scale hydraulic excavation or mechanical excavation (accessibility in unstable material, maneuverability around debris), and the added information that would result from a single effort. The principal disadvantage of this approach was that the process water had to be pumped approximately 300 m (1,000 ft) to the excavation point.

#### Equipment

Because of the distance between the staging area and the freshwater source, a larger water pump, transfer hoses, and generator were required than for the original staging area. Water pump, generator, and flexible hoses with quick couplings were available and obtained on a short-term rental basis. The MetPro mobile unit was as previously described in the section "Project Activities," consisting of a trailer, slurry pump, sump, and 0.6-m (24-in.) MDS (Figure 8). The eductor pump was fitted with an exterior ring, providing water jets for horizontal excavation (Figure 9). A powerscreen was also rented for screening the mechanically excavated material (Figures 10 and 11). The unit consisted of a grizzly, hopper with shredder, conveyer and shaking screen, equipped with a



Figure 8. MetPro mobile MDS unit



Figure 9. Eductor pump



Figure 10. Powerscreen



Figure 11. Screen undersize

harp screen to enhance processing of clayey material and reduce plugging due to wet material.

#### Field operation

The generator and water pump performed well, and similar equipment should be readily available at most locations. The flexible hoses were not designed to operate at the optimum delivery pressure, however. Several failures of the coupling/hose attachment occurred, but once this problem was addressed, the hoses performed reasonably well with the pump discharge throttled back somewhat. Based on this experience, however, it is thought that suitable hoses should be purchased for future operations. The eductor pump, although somewhat crudely assembled for the purposes of demonstration, performed fairly effectively. Although the site was heavily vegetated, the vegetation did not prevent excavation of the sediment in situ. Some variability was noted in the feed percent solids. Although this does not appear to have adversely affected the separation achieved, the result is an inefficient utilization of available water supply; and under different circumstances, separation efficiency could be affected. The pump did plug with large woody debris on two or three occasions. This could be prevented with a coarse protective screen at the pump intake. Additionally, no water jets faced in the downward direction. Excavation was impeded when a large rock was encountered underneath the pump. The sump and cyclone performed as expected. There was one failure of a band coupling, and this is potentially a weak point in the system. This connection could be made more secure with permanent piping, rather than the flexible hoses used to deliver the slurry pump discharge to the hydrocyclone inlet.

The Powerscreen performed relatively well considering that the material being fed was much wetter than the equipment is designed to handle. Problems were encountered, however, in feeding the screen. Clay clods rolled off the grizzly, reporting with the oversize. Attempts to push this material through the grizzly were only partially successful and time-consuming. The shaking screen passed the moist, fine materials without any evident problem, but blinding did occur on the coarse upper screen, where 0.1- to 0.15-m (4- to 6-in.) chunks of asphalt collected and had to be manually scraped off. Although the results indicate that the Powerscreen may be useful to prepare a small amount of material for process testing, feeding a full-scale hydrocyclone operation in this manner is probably infeasible.

#### **Visitors**

The demonstration was scheduled for 10 August 2000. Notice of the demonstration was posted on the Detroit District Web site, and notification sent directly to regulators and environmental organizations in the region. Approximately 30 people attended the demonstration. Results of the demonstration were also presented to the Great Lakes Commission in October 2000.

#### Process sampling

Three 19-L (5-gal) samples were taken simultaneously from the feed slurry and overflow, and three 4-L (1-gal) samples were taken from the underflow at five different intervals during processing (1400, 1505, 1525, 1625, and 1715 hours). Samples were captured and transported in new HDPE buckets. Of these, two from each sampling event were designated for particle size distribution and contaminant concentration analysis. The remainder of the samples were designated for particle size distribution only. The field sampling contractor was responsible for obtaining process samples and packaging and shipping them to ERDC. The overflow was sampled using a J-shaped diverter of polyvinyl chloride (PVC) pipe, which was passed through the overflow stream vertically to obtain a representative sample. The feed stream was sampled from a port welded onto the outlet from the slurry pump, where the slurry was expected to be turbulent and therefore well mixed. The line was purged for a few seconds prior to taking each sample. Underflow samples were captured directly from the cyclone underflow discharge. The volume of underflow samples was reduced from that specified in the Quality Assurance Project Plan<sup>1</sup> due to the high solids content of the underflow; 4-L (1-gal) samples were sufficient for all proposed analysis. Samples designated for chemical analysis were placed in a cooler and packed in ice for shipment. Samples designated for particle size analysis only were not refrigerated. Chain-of-custody forms were completed.

A single 19-L (5-gal) sample of the process supply water was also taken to establish baseline concentrations. It was initially proposed to sample effluent at the pond discharge during and after processing to verify that no permit parameters were violated during processing. However, water levels in the pond were low enough that there was no discharge from the pond at the time of processing, and the process overflow was passed through a sand drainage bed prior to being returned to the pond, reducing suspended solids. Dissolved contaminant levels were therefore measured in the process overflow and compared to Freshwater Acute Federal water quality criteria (USEPA 1999a). Of the parameters measured in the overflow having criteria, none exceeded acute water quality criteria.

Upon arrival at ERDC, the samples were refrigerated, and samples designated for chemical analysis were quickly processed to meet specified holding times. The feed and overflow slurry samples designated for chemical analysis (two field duplicates per stream per sampling time) were sampled while being stirred to obtain representative samples of the slurry. They were then centrifuged, and both solids and supernatant collected for chemical analysis. Percent solids of the underflow samples was much higher, and subsamples were taken directly from the buckets for chemical and particle size analysis without centrifuging. Subsamples of all process solids were also taken for water content and particle size analysis. Due to the difficulty involved in obtaining a representative subsample from a slurry, slurry samples were allowed to settle for

22

<sup>&</sup>lt;sup>1</sup> The QAPP describes the technical quality assurance/quality control for specific data collection, project objectives and organization, sampling design, analytical methods, data quality indicators, and data review (USEPA 1997, 1998).

an extended period of time. The supernatant was then poured off, the supernatant and remaining wet solids weighed, and then water content of the wet solids determined by oven drying. In this manner, the initial solids content of the slurry could be calculated. The settled solids were analyzed on the Coulter particle size analyzer for particle size distribution.

#### Results

#### Particle size analysis

Results of the particle size data for samples taken from the feed and overflow samples while stirring versus samples taken from the settled slurries were different. Because the settled slurries were still relatively liquid but at a higher percent solids, it was possible to mix them thoroughly and avoid rapid settling of coarse particles, thus producing more representative samples of all size ranges in the solids. The feed and overflow particle size distributions reported in Table 5 are for the subsamples taken from the settled samples. The underflow contained less than 8 percent fines by volume. Depending upon the specific gravity of the particles, this can be converted to percent fines by weight. Because the Coulter counter measures particle volume only (void volume is not measured), percent sand by volume can be taken to be approximately equivalent to percent sand by mass, assuming the same specific gravity for all particles in the material.

#### Percent moisture/percent solids

Results of percent moisture ( $W_{water}/W_{total}$ ) and percent solids ( $W_{solids}/W_{total}$ ) for the process streams are summarized in Table 6. The percent solids of the feed varied from 1.8 to 5.9 percent by weight. This is a relatively dilute feed stream. Although the separation efficiency is enhanced by a dilute feed stream, operational efficiency overall is lower than optimum. Percent solids of the underflow was quite high, ranging from 75.2 to 80.3 percent, reflecting the coarse nature of the underflow. Mean percent moisture of the underflow was approximately 22 percent, compared with approximately 98 percent for the feed and overflow process streams.

#### Chemical analysis

The results of the chemical analysis for each replicate at each sampling time were averaged for the three process streams, and are summarized in Table 7. For comparison, results of the bench-scale characterization for these fractions are given in parentheses. Qualitatively, the bench-scale testing appears to have given a relatively representative indication of the contaminant levels in the field-scale process streams. To evaluate whether the concentrations in the process and characterization fractions are essentially equivalent, the data were evaluated. Contaminants included arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, barium, PCB 1242, PCB 1260, TOC, oil and grease, and TRPH. One-half the detection limit was used for contaminant concentrations less than the detection limit. The Statistical Analysis System (SAS) release 8.1 was used to perform the data analysis (SAS Institute, Inc., 1989a, 1989b). The statistical procedures and assumptions are more fully

Table 5			
Particle Siz	e Analysis of Streams	from the Mobile Hy	drocyclone
Demonstra	tion		
Sample	Sand Volume % > 76.42 µm	Silt Volume % 5-76.42 µm	Clay Volume % < 5 µm
	Fe	eed	
F1400	26.2	55.6	18.2
F1505	23.4	59.1	17.5
F1525	33.5	49.6	16.9
F1625	26.9	55.2	17.9
F1715	30.4	52.5	17.1
Average	28.1	54.4	17.5
	Ove	rflow	
O1400	15.7	61.8	22.5
O1505	11.5	68.7	19.8
O1525	22.5	57.5	20
O1625	19.7	63.8	16.5
O1715	23.9	55.9	20.2
Average	18.7	61.5	19.8
	Unde	erflow	
U1400	91.36	7.02	1.62
U1505	92.12	6.56	1.32
U1525	90.23	8.05	1.72
U1625	92.52	6.08	1.4
U1715	94.31	4.43	1.26
Average	92.11	6.43	1.46

described in Appendix B. On the basis of the statistical analysis, the following generalizations regarding concentrations in the process streams and bench-scale samples, respectively, can be made:

- a. Underflow = sand
- b. Overflow = silt/clay for zinc, oil and grease, and TRPH
- c. Overflow < silt/clay for all other analytes except TOC
- d. Overflow > silt/clay for TOC
- e. Feed = bulk for all analytes except PCB 1260
- f. Feed > bulk for PCB 1260

The statistical power of the analysis for most analytes was less than 75. The power was greater than 75 for comparison of nickel in underflow and sand, and for PCB 1242 in feed and bulk for the one-tailed tests. Power was also greater than 75 for comparison of nickel and PCB 1260 in underflow and sand and for comparison of arsenic, chromium, nickel, barium, PCB 1242, PCB 1260, oil and grease, and TRPH in feed and bulk for the two-tailed tests.

Table 6 Percent Moisture and Percent Solids of Process Streams							
Sample Percent Moisture Percent Solids							
	Feed						
F1400	94.08	5.92					
F1505	98.53	1.47					
F1525	98.18	1.82					
F1625	98.53	1.47					
F1715	98.19	1.81					
Average	97.5	2.5					
	Overflow						
O1400	96.94	3.06					
O1505	98.80	1.20					
O1525	98.88	1.12					
O1625	99.09	0.91					
O1715	98.66	1.34					
Average	98.5	1.5					
	Underflow						
U1400-3	19.84	80.16					
U1505-3	24.77	75.23					
U1525-3	24.59	75.41					
U1625-3	19.69	80.31					
U1715-3	20.62	79.38					
Average	21.9	78.1					

From a practical standpoint, it appears that the bench-scale characterization will give predicted concentrations at least within the same order of magnitude as the field process. In some cases, it is quite representative of the contaminant distribution that will be achieved at full scale for this process. From a processing objective, the statistical analysis suggests that the quality of the underflow was higher than the quality of the sand produced in the bench-scale testing, which is a favorable outcome. In some cases this may be attributable to lower concentrations in the process feed, but for other constituents this is not the case. SAS output is presented in Appendix B.

With regard to the processing objectives, the contaminant concentrations in the underflow ranged from 2 percent to 39 percent of that in the feed. PCBs were reduced 95 percent (Arochlor 1242) and 92 percent (Arochlor 1260), from 2,714  $\mu$ g/kg to 144  $\mu$ g/kg, and from 145  $\mu$ g/kg to 11.9  $\mu$ g/kg, respectively. TOC, oil and grease, and TRPH were significantly reduced in the process underflow. Most metals concentrations were reduced by an order of magnitude in the underflow, selenium, silver, and molybdenum being the exceptions. Selenium was reduced by a factor of 2.6, silver by a factor of 2.6, and molybdenum by a factor of 7.8.

Data validation sheets are included in Appendix C. Data were evaluated on the basis of representativeness, comparability, and completeness.

	A Calculation of the Calculation	Process Solids			Process Water			
Analyte	Feed	Overflow	Underflow	Supply	Feed Supernatant	Overflow Supernatant	Underflow Supernatant	
		•		ndicator Analyte	S			
TOC (mg/kg)	26,500 (27300)	46,480 (21100)	1019 (1435)					
TV\$ (%)	<4 (<4)	<4	<4					
O&G (mg/kg)	332 (220)	435 (475)	16 (43)					
TRPH (mg/kg)	259 (185)	338 (270)	<42.2 (10.5J)					
				PCBs				
Arochlor 1242 (ppb)	2713.8 (3754.5)	4037.9 (5927.5)	144.0 (444)	<0.24	0.27	0.21	N/A	
Arochlor 1260 (ppb)	145.0 (39)	109.9 (317.5)	11.9 (21.4)	<0.24	<0.24	<0.26	N/A	
100 to 10			<u></u>	Metals				
As (ppm)	2.805 (2.2)	3.4 (5.05)	0.4883 (0.45)	0.005	0.0039	0.0041	N/A	
Cd (ppm)	0.5809 (0.6045)	0.82 (1.355)	0.05908 (0.04)	<0.0002	<0.0002	<0.0002	N/A	
Cr (ppm)	38.44 (29.8)	48.8 (79.95)	2.896 (3.05)	0.006	0.0046	0.0055	N/A	
Cu (ppm)	37.81 (32.8)	50 (75.25)	3.386 (10.05)	0.003	0.0025	0.0021	N/A	
Pb (ppm)	41.69 (43.7)	59.6 (101.2)	2.937 (5.6)	<0.001	<0.001	<0.001	N/A	
Hg (ppm)	0.8834 (1.085)	1.3 (3.45)	<0.040 (0.02)	<0.00020	<0.00020	<0.00020	N/A	
Ni (ppm)	15.718 (10.8)	19.0 (27.1)	2.578 (2.2)	0.014	0.0096	0.0093	N/A	
Se (ppm)	0.5116 (0.4995)	0.65 (1.1)	0.2 (<0.200)	0.002		0.002	N/A	
Ag (ppm)	0.3447 (0.4995)	0.53 (0.8995)	0.1333 (0.4)	<0.001	<0.001	<0.001	N/A	
Zn (ppm)	81.4 (76.1)	116.9 (148.55)	5.431 (13.5)	0.046	0.0428	0.0396	N/A	
Ba (ppm)	61.12 (42.85)	79.4 (104.5)	5.5052 (4.6)	0.108	0.1828	0.1769	N/A	
Fe (ppm)	14251 (3822.4)	18010	1879	0.08	0.1304	0.0703	N/A	
Mg (ppm)	15200	17740	N/A	75.6	76.85	78.19	N/A	
Mn (ppm)	275.2 (140)	366.2 (325.5)	47.71 (44.25)	3.03	1.609	1.60	N/A	
Mo (ppm)	0.7798 (0.3495)	0.40 (0.849)	0.1 (<0.100)	<0.001	0.003	0.0033	N/A	

Representativeness and comparability are qualitative criteria, and completeness is a quantitative criterion. Representativeness is a key concern during field sampling activities, and expresses the degree to which sample data accurately represent the site, specific matrices, and parameter variations at a sampling point. Representativeness is dependent on the proper design of the sampling program, proper selection of laboratory methods for the matrix under scrutiny, and stability of the laboratory methods. The representativeness criterion is best satisfied by making certain that the sampling locations, procedures, and quantities are selected based on the project objectives, and that suitable analytical procedures are utilized, preservation requirements are met, and holding times are not exceeded in the laboratory.

Comparability expresses the confidence with which one data set can be compared with another. The analysis of certified reference materials is used to provide data on comparability. The data obtained within this project will be comparable because all the standard operating procedures used in the determinations are based on methods with proven protocols and proven internal and external audit compliance relative to performance testing on certified reference material soils. All analyses of a single type will be conducted at the same laboratory. Completeness of the deliverable is measured for each set of data received by dividing the number of valid (passing quality assurance/quality control (QA/QC) requirements) measurements actually obtained by the number of measurements made. Each of the analytical parameters is evaluated separately in terms of precision, accuracy, and data acceptability. Precision pertains to the repeatability of the test, and is determined using a relative percent difference for duplicate samples and, for three or more replicate analysis, as a relative standard deviation or coefficient of variation. Most literature suggests that the goal for precision among field duplicates should be within 30 percent expressed as a relative percentage difference. Accuracy pertains to the closeness to the true value, and is evaluated using matrix spike recoveries expressed as a percent recovery. Completeness is then calculated on the basis of the number of samples meeting the established OA/OC requirements, as previously described. Acceptable completeness for a data set has been set at 90 percent meeting QA/QC requirements.

Completeness of the data was above 90 percent for all three data sets (Cells 4 and 5 characterization and field demonstration data). Some data were qualified due to minor problems. Corrective actions and data qualifications are detailed in the individual data validation sheets attached in Appendix C.

## **Equipment Acquisition**

On the basis of the performance of the 0.6-m (24-in.) MDS, a 0.3-m (12-in.) MDS was purchased for laboratory and field-scale feasibility testing. The capacity of the 0.3-m (12-in.) MDS is not sufficient for large-scale processing, but is better suited for feasibility testing because the volumes of process water required are more manageable, and the supporting equipment is correspondingly smaller and more widely available. A vibrating wet screen was also purchased for screening out oversize prior to the sump of the hydrocyclone, and fitted with 13-mm (1/2-in.) and 6-mm (1/4-in.) screens. Either dry or slurried material can

be fed onto the screen. The screen was ordered with excess capacity so that it could also be used with full-scale processing operations.

#### 3 Conclusions

The principal objectives of the project were to evaluate the efficiency of the 0.6-m (24-in.) MDS in producing a sand fraction with fines and PCB concentrations sufficiently reduced to permit beneficial use, and to evaluate the correspondence of contaminant levels predicted by bench-scale testing versus field-scale operation. The target product (sand) specifications were less than 10 percent fines by mass and PCB concentrations less than 1 mg/kg. The underflow fraction produced averaged over 92 percent sand, as measured by a Coulter counter, and 0.144 mg/kg PCB 1242 and 0.0119 mg/kg PCB 1260. Based on statistical analysis of the results, the contaminant concentrations predicted for the sand fraction by the bench-scale testing were essentially equivalent to that achieved in the field operation. This is particularly significant since the process feed concentration of PCB 1260 was statistically greater than the bulk sediment concentration for the bench-scale testing. This indicates a somewhat higher efficiency of PCB removal for the MDS compared with that of wet sieving of the material. This may be attributable to the presence of coarse organic particles, which would report with the sand on a wet sieve, but would report with the overflow of a hydrocyclone. This is supported by the higher TOC concentration measured in the process overflow compared with that of the silt/clay fraction of the bulk sediment used in bench-scale testing. Distribution of metals was somewhat more variable than for PCBs, but metals were reduced by an order of magnitude in the sand fraction, with the exception of selenium, silver, and molybdenum. Selenium, silver, and molybdenum were reduced by factors of 2.6 to 7.8. In the absence of specific criteria establishing acceptable levels of metal constituents, partitioning theory could be used to evaluate the magnitude of potential release of metals in the beneficial use environment. Predicted releases could then be compared with applicable water quality criteria and necessary dilutions estimated.

Chapter 3 Conclusions 29

#### References

- Granat, M. A. (1998). "Jacksonville District hydrocyclone experience." Proceedings of the 11<sup>th</sup> Annual National Conference on Beach Preservation Technology, Tallahassee, FL, February 4-6, 1998.
- Olin-Estes, T. J. (2000). "Determining recovery potential of dredged material for beneficial use Site characterization: Statistical approach," *DOER Technical Notes Collection* (ERDC TN-DOER-C15), U.S. Army Engineer Research and Development Center, Vicksburg, MS. www.wes.army.mil/el/dots/doer
- Olin, T. J., and Bowman, D. W. (1996). "Soil washing potential at confined disposal facilities," U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
- Olin-Estes, T. J., and Palermo, M. R. (2000a). "Determining recovery potential of dredged material for beneficial use—Site characterization: Prescriptive approach," *DOER Technical Notes Collection* (ERDC TN-DOER-C14), U.S. Army Engineer Research and Development Center, Vicksburg, MS. www.wes.army.mil/el/dots/doer
- . (2000b). "Determining recovery potential of dredged material for beneficial use—Soil separation concepts," *DOER Technical Notes Collection* (ERDC TN-DOER-C13), U.S. Army Engineer Research and Development Center, Vicksburg, MS. www.wes.army.mil/el/dots/doer
- SAS Institute, Inc. (1989a). "SAS/STAT User's Guide, Version 6, Volume 1," 4th ed., Cary, NC.
- \_\_\_\_\_. (1989b). "SAS/STAT User's Guide, Version 6, Volume 2," 4th ed., Cary, NC.
- Snedecor, G. W., and Cochran, W. G. (1980). *Statistical Methods*, 7th ed., The Iowa State University Press, Ames, IA.
- U.S. Environmental Protection Agency. (1986). "Test methods for evaluating solid waste physical and chemical methods," SW-846, 2d ed., National Technical Information Service, Springfield, VA (NTIS No. PB87-120291).
- . (1994). "Pilot-scale demonstration of sediment washing for the treatment of Saginaw River sediments," EPA 905-R94-019, Assessment and Remediation of Contaminated Sediments Program, Great Lakes National Program Office, Chicago, IL.

U.S. Environmental Protection Agency. (1997). "EPA requirements for Quality Assurance Project Plans for environmental data operations," EPA QA/R-5, Washington, DC.
\_\_\_\_\_\_. (1998). "EPA guidance for Quality Assurance Project Plans," EPA/600/R-98/018, Washington, DC.
\_\_\_\_\_\_. (1999a). "National Recommended Water Quality Criteria— Correction," EPA 822-Z-99-001, Office of Water.
\_\_\_\_\_. (1999b). "Physical separation (soil washing) for volume reduction of contaminated soils and sediments: Processes and equipment," EPA-905-R-99-006, Great Lakes National Program Office, Chicago, IL.

## Appendix A Coulter Counter Particle Size Analysis, Cell 4 Material



Page 1 22 May 2002 11:10

#### - US Waterways Experiment Station -

File name: Operator:

C4b.\$av Susan Bailey Fraunhofer

Optical model: LS 100Q

Fluid Module

Water

Run length:

60 seconds

Fluid: Software:

3.01 2.11

Firmware:

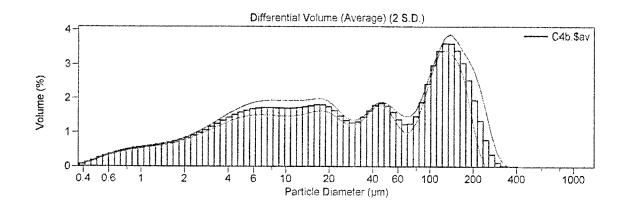
2.02 2.02

Average of 3 Files:

C4b1.\$av

C4b2.\$av

C4b3.\$av



Volume Statistics (Arithmetic)

C4b.\$av

#### Calculations from 0.375 $\mu m$ to 948.2 $\mu m$

Volume: 100% Mean: 59.32 µm S.D.: Median: 25.95 μm C.V.: D(3,2): 6.291 µm Mode: 127.6 µm

65.88 µm 111%

% < 10 25 90 25.95 μm 2.371 6,565 107.9 161.7



Page 2 22 May 2002 11:13

#### -US Waterways Experiment Station -

•					
C4b.\$av					
Channel	Particle	Cum. <	Channel	Particle	Cum. <
Number	Diameter	Volume	Number	Diameter	Volume
	(Lower)	*		(Lower)	& S
	•	v			ъ
	hur			μm	
1	0.375	0	51	39.77	56.4
2	0.412	0.070	52	43.66	58.2
3 4	0.452 0.496	0.19	53	47.93	60.0
5	0.545	0.38 0.64	54 55	52.63 57.77	61.8
6	0.598	0.96	56	63.41	63.4 64.7
7	0.657	1.33	57	69.62	66.0
8	0.721	1.75	58	76.43	67.2
9	0.791	2.22	59	83.90	68.7
10	0.869	2.72	60	92.09	70.6
11	0.953	3.25	61	101.1	73.0
12 13	1.047 1.149	3.81 4.38	62	111.0	75.9
14	1.261	4.98	63 64	121.8 133.7	79.3 82.9
15	1.385	5.61	65	146.8	86.5
16	1.520	6.27	66	161.2	89.9
17	1.669	6.95	67	176.8	92.9
18	1.832	7.69	68	194.2	95.5
19	2.010	8.47	69	213.2	97.4
20 21	2.207 2.423	9.31	70	234.1	98.7
22	2.660	10.2 11.2	71 72	256.8 282.1	99.5
23	2.920	12.3	73	309.6	99.9 99.97
24	3.206	13.4	74	339.8	99.997
25	3.519	14.7	75	373.1	100
26	3.862	16.0	76	409.6	100
27	4.241	17.5	77	449.7	100
28 29	4.656 5.111	19.0	78	493.6	100
30	5.611	20.5 22.2	79 80	541.9 594.9	100
31	6.158	23.9	81	653.0	100 100
32	6.761	25.6	82	716.9	100
33	7.421	27.3	83	786.9	100
34	8.147	29.0	84	863.9	100
35. 36	8.944	30.7		948.2	100
30 37	9.819 10.78	32.4 34.1			
38	11.83	35.8			
39	12.99	37.5			
40	14.26	39.2			
41	15.65	41.0			
42	17.18	42.8			
43	18.86	44.6			
45	20.70 22.73	46.3 48.0		•	
46	24.95	49.4			
47	27.38	50.8			
48	30.07	52.1			
49	33.00	53.4			
50	36.24	54.8			



Page 1 22 May 2002 11:13

#### US Waterways Experiment Station

File name: Operator:

C4b.\$av Susan Bailey

Optical model: LS 100Q

Fraunhofer Fluid Module

Fluid:

Water

Run length:

60 seconds

Software:

3.01 2.11

Firmware:

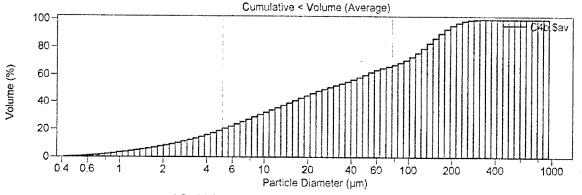
2.02 2.02

Average of 3 Files:

C4b1.\$av

C4b2.\$av

C4b3.\$av



LC= 20.54% < 5.111 µm UC= 67.22% < 76.43 µm {46.68%}

Volume Statistics (Arithmetic)

C4b.\$av

#### Calculations from 5.111 µm to 76.43 µm

Volume:

46.7%

Mean: Median: 25.13 µm 18.19 µm

S.D.: C.V.: 18.77 µm

D(3,2):

14.33 µm

74.7%

Mode: % <

μm

45.75 µm

10

6.639

25 9,729

50 18.19 75 37.89 90 55.08



Page 2 22 May 2002 11:05

#### -US Waterways Experiment Station -

C4b.\$av					
Channel	Particle	Cum. <	Channel	Particle	Cum. <
Number	Diameter	Volume	Number	Diameter	Volume
	(Lower)	8		(Lower)	26
	ım.	•		ım	
1	0.375	0 '	51	39.77	56.4
2	0.412	0.070	52	43.66	58.2
3	0.452	0.19	53	47.93	60.0
. 4	0.496	0.38	54	52.63	61.8
5	0.545	0.64	55	57.77	63.4
6 7	0.598 0.657	0.96 1.33	56 57	63.41 69.62	64.7 66.0
8	0.721	1.75	58	76.43	67.2
9	0.791	2.22	59	83.90	68.7
10	0.869	2.72	60	92.09	70.6
11 12	0.953 1.047	3.25 3.81	61 62	101.1 111.0	73.0 75.9
13	1.149	4.38	63	121.8	79.3
14	1.261	4.98	64	133.7	82.9
15	1.385	5.61	65	146.8	86.5
16 17	1.520 1.669	6.27 6.95	66 67	161.2 176.8	89.9 92.9
18	1.832	7.69	68	194.2	95.5
19	2.010	8.47	69	213.2	97.4
20	2.207	9.31	70	234.1	98.7
21 22	2.423 2.660	10.2 11.2	71 72	256.8 282.1	99.5 99.9
23	2.920	12.3	73	309.6	99.97
24	3.206	13.4	74	339.8	99.997
25	3.519	14.7	75	373.1	100
26 27	3.862 4.241	16.0 17.5	76 77	409.6 449.7	100 100
28	4.656	19.0	78	493.6	100
29	5.111	20.5	79	541.9	100
30	5.611	22.2	80	594.9	100
31 32	6.158 6.761	23.9 25.6	81 82	653.0 716.9	100 100
33	7.421	27.3	83	786.9	100
34	8.147	29.0	84	863.9	100
35	8.944	30.7	*	948.2	100
36 <b>3</b> 7	9.819 10.78	32.4 34.1			
38	11.83	35.8			
39	12.99	37.5			
40	14.26	39.2			
41 42	15.65 17.18	41.0 42.8			
43	18.86	44.6			
44	20.70	46.3			
45	22.73	48.0			
46 47	24.95 27.38	49.4 50.8			
48	30.07	52.1			
49	33.00	53.4			
50	36.24	54.8			



Page 1 22 May 2002 11:20

#### ·US Waterways Experiment Station -

File name: Operator:

C4b.\$av Susan Bailey

Optical model: LS 100Q

Fraunhofer Fluid Module

Fluid:

Water

Run length:

60 seconds

Software:

3.01 2.11

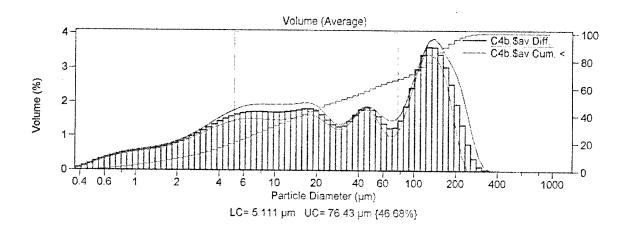
Firmware:

2.02 2.02

Average of 3 Files: C4b1.\$av

C4b2.\$av

C4b3.\$av



### Appendix B Statistical Analysis of Results

#### Statistical Procedures, Assumptions and Analysis

**Step (A).** Evaluate the equality of variance assumption using the folded form of the F statistic (Snedecor and Cochran 1980). The null hypothesis is that the variance of group 1 is equal to the group 2 variance. The alternative hypothesis is that the variance of group 1 is not equal to the group 2 variance. These results are shown in Tables B3, B6, and B9. If probability Pr > F is less than 0.05, the null hypothesis was rejected.

Step (B). If the equality of variance hypothesis is not rejected, the test statistic was calculated using a pooled estimate of the variance. If the equality of variance hypothesis is rejected, a test statistic that assumes unequal population variances was utilized (Snedecor and Cochran 1980). These results are shown in Tables B2, B5, and B8. The respective hypotheses were expressed as HO:  $\mu$ Feed  $\leq \mu$ Bulk and HA:  $\mu$ Feed  $> \mu$ Bulk; HO:  $\mu$ Underflow  $\leq \mu$ Sand and HA:  $\mu$ Underflow  $> \mu$ Sand; HO:  $\mu$ Overflow  $\leq \mu$ Silt/Clay and HA:  $\mu$ Overflow  $> \mu$ Silt/Clay. The one-tailed t-test was conducted at  $\alpha$ =0.05. For a one-tailed t-test halve the Prov >|T| value. Reject the null hypothesis if half the Prob > |T| is less than 0.05.

From the underflow and sand data one would conclude that the underflow mean concentrations are less than or equal to the sand mean concentrations (Table B2). For the current experimental design, the mean comparison for nickel was the only comparison with a power greater than 0.75. From the overflow and silt/clay data one would conclude that the arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, barium, PCB 1242, PCB 1260, oil and grease, and TRPH overflow mean concentrations are less than or equal to the silt/clay mean concentrations and the TOC overflow mean concentration is greater than the silt/clay mean concentration (Table B5). For the current experimental design, the TOC and TRPH comparisons were the only comparisons with a power greater than 0.75. From the feed and bulk data one would conclude that the arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, barium, PCB 1242, TOC, oil and grease, and TRPH feed mean concentrations are less than or equal to the bulk mean concentrations and the PCB 1260 feed mean concentration is greater than the bulk mean concentration (Table B8). For the current experimental design, the PCB 1242 comparison was the only comparison with a power greater than 0.75.

An alternate way to write the respective hypotheses was HO:  $\mu$ Feed =  $\mu$ Bulk and HA:  $\mu$ Feed  $\neq \mu$ Bulk; HO:  $\mu$ Underflow =  $\mu$ Sand and HA:  $\mu$ Underflow  $\neq \mu$ Sand; HO:  $\mu$ Overflow =  $\mu$ Silt/Clay and HA:  $\mu$ Overflow  $\neq \mu$ Silt/Clay. Reject the null hypothesis if the Prob > |T| is less than 0.05.

From the underflow and sand data one would conclude that the underflow mean concentrations are equal to the sand mean concentrations (Table B2). For the current experimental design, the nickel and PCB 1260 comparisons were the

<sup>&</sup>lt;sup>1</sup> References cited in this appendix are included in the References section at the end of the main text.

only comparisons with a power greater than 0.75. From the overflow and silt/clay data one would conclude that the zinc, oil and grease, and TRPH overflow mean concentrations are equal to the silt/clay mean concentrations and the arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, barium, TOC, PCB 1242, and PCB 1260 overflow mean concentrations are not equal to the silt/clay mean concentrations (Table B5). For the current experimental design, the power of the comparison for arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, barium, PCB 1242, PCB 1260, and TOC was greater than 0.75. From the feed and bulk data one would conclude that the arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, zinc, barium, TOC, oil and grease, and TRPH feed mean concentrations are equal to the bulk mean concentrations and the PCB 1242 and PCB 1260 feed mean concentrations are not equal to the bulk mean concentrations (Table B8). For the current experimental design, the power of the comparison for arsenic, chromium, nickel, barium, PCB 1242, PCB 1260, oil and grease, and TRPH was greater than 0.75.

Table B1 Sand and Underflow Summary

			Lower CL		Upper CL	Lower CL		Upper CL	
Variable	TYPE	N	Mean	Mean	Mean	Std Dev	Std Dev	Std Dev	Std Err
AS	SAND	2	-0.185	0.45	1.0853	0.0315	0.0707	2.2564	0.05
AS	UNDERFLOW	10	0.4376	0.4883	0.539	0.0487	0.0709	0.1294	0.0224
AS	Diff (1-2)		-0.161	-0.038	0.084	0.0495	0.0709	0.1243	0.0549
CD	SAND	2	-0.087	0.04	0.1671	0.0063	0.0141	0.4513	0.01
CD	UNDERFLOW	10	-0.002	0.0591	0.12	0.0586	0.0851	0.1554	0.0269
CD	Diff (1-2)		-0.159	-0.019	0.1205	0.0565	0.0809	0.1419	0.0626
CR	SAND	2	-2.668	3.05	8.7678	0.2839	0.6364	20.308	0.45
CR	UNDERFLOW	10	2.4997	2.896	3.2923	0.3811	0.554	1.0114	0.1752
CR	Diff (1-2)		-0.817	0.154	1.1253	0.3932	0.5628	0.9876	0.4359
CU	SAND	2	-71.91	10.05	92.005	4.0696	9.1217	291.07	6.45
CU	UNDERFLOW	10	2.0019	3.386	4.7701	1.3309	1.9349	3.5324	0.6119
CÜ	Diff (1-2)		0.763	6.664	12.565	2.389	3.4191	6.0002	2.6484
PB	SAND	2	-26.17	5.6	37.366	1.5774	3.5355	112.82	2.0404
PB	UNDERFLOW	10	2.2494	2.937	3.6246	0.6611	0.9612	1.7547	0.3039
PB	Diff (1-2)	10	0.173	2.663	5.153	1.0081	1.4427		
HG	SAND	2	-0.097	0.03	0.1571	0.0063	0.0141	2.5319	1.1175
HG	UNDERFLOW	10	0.02	0.03	0.1371	0.0063		0.4513	0.01
HG	Diff (1-2)	10	0.0023	0.02	0.02	0 0021	0		0
NI	SAND	2				0.0031	0.0045	0.0078	0.0035
NI		10	-1.612	2.2	6.0119		0.4243	13.538	0.3
	UNDERFLOW	10	2.1989	2.578	2.9571	0.3645	0.5299	0.9674	0.1676
NI SE	Diff (1-2)	2	-1.276	-0.378	0.52	0.3636	0.5203	0.9131	0.403
	SAND		0.1	0.1	0.1	•	0	•	0
SE	UNDERFLOW	10	0.1	0.1	0.1	•	0	•	0
SE AG	Diff (1-2)	2		0			0		_ :
AG AG	SAND	_	-0.871	0.4	1.6706	0.0631	0.1414	4.5128	0.1
AG	UNDERFLOW	10	0.0615	0.08	0.0985	0.0178	0.0258	0.0471	0.0082
	Diff (1-2)	_	0.232	0.32	0.408	0.0356	0.051	0.0895	0.0395
ZN ZN	SAND	2	-8.101	13.5	35.101	1.0726	2.4042	76.717	1.7
ZN	UNDERFLOW	10	4.9366	5.431	5.9254	0.4754	0.6912	1.2618	0.2186
BA	Diff (1-2)	2	6.3362	8.069	9.8018	0.7015	1.004	1.7619	0.7777
	SAND	_	-4.294	4.6	13.494	0.4417	0.9899	31.589	0.7
BA	UNDERFLOW	10	3.7931	5.052	6.3109	1.2104	1.7598	3.2127	0.5565
BA	Diff (1-2)	•	-3.384	-0.452	2.4796	1.1868	1.6986	2.9809	1.3157
pcb_1242	SAND	2	-559.8	444	1447.8	49.845	111.72	3565.1	79
pcb_1242	UNDERFLOW	10	126.31	144.03	161.75	17.035	24.767	45.214	7.8319
pcb_1242	Diff (1-2)	_	226.74	299.97	373.2	29.646	42.429	74.461	32.866
pcb_1260	SAND	2	-71.36	21.4	114.16	4.6059	10.324	329.43	7.3
pcb_1260	UNDERFLOW	10	8.3325	11.91	15.487	3.4399	5.001	9.1298	1.5814
pcb_1260	Diff (1-2)		-0.45	9.49	19.43	4.024	5.7591	10.107	4.461
toc	SAND	2	-788.6	1435	3658.6	110.42	247.49	7897.4	175
toc	UNDERFLOW	10	539.92	1019	1498.1	460.65	669.71	1222.6	211.78
toc	Diff (1-2)	_	-688.8	416	1520.8	447.28	640.14	1123.4	495.85
OG	SAND	2	-122.2	43	208.18	8.2024	18.385	586.66	13
OG	UNDERFLOW	10	14.003	17.55	21.097	3.4102	4.9579	9.0512	1.5678
OG	Diff (1-2)		12.543	25.45	38.357	5.2251	7.4781	13.124	5.7925
TRPH	SAND	2	-97.5	10.5	118.5	5.3631	12.021	383.59	8.5
TRPH	UNDERFLOW	10	20.058	20.85	21.642	0.7613	1.1068	2.0206	0.35
TRPH	Diff (1-2)		-17.16	-10.35	-3.544	2.7555	3.9437	6.9209	3.0548

Table B2 Sand and Underflow T-Test Results

	Variable	Method	Variances	DF	t Value	Pr > t
	AS	Pooled	Equal	10	-0.70	0.5012
	AS	Satterthwaite	Unequal	1.44	-0.70	0.5803
	CD	Pooled	Equal	10	-0.70	0.7669
	CD	Satterthwaite	Unequal	9.95	-0.50	0.7869
	CR	Pooled	Equal	10	0.35	0.7312
	CR CR	Satterthwaite	-	1.32	0.35	
	CU	Pooled	Unequal			0.7928
			Equal	10	2.52	0.0306
	CU	Satterthwaite	Unequal	1.02	1.03	0.4886
	PB	Pooled	Equal	10	2.38	0.0384
	PB	Satterthwaite	Unequal	1.03	1.06	0.4782
	HG	Pooled	Equal	10	2.89	0.0162
	HG	Satterthwaite	Unequal	1	1.00	0.5000
	NI	Pooled	Equal	10	-0.94	0.3704
	NI	Satterthwaite	Unequal	1.7	-1.10	0.4026
	SE	Pooled	Equal	10	•	
	SE	Satterthwaite	Unequal	10		
	AG	Pooled	Equal	10	8.10	<.0001
	AG	Satterthwaite	Unequal	1.01	3.19	0.1908
	ZN	Pooled	Equal	10	10.38	<.0001
	ZN	Satterthwaite	Unequal	1.03	4.71	0.1273
•	BA	Pooled	Equal	10	-0.34	0.7383
	BA	Satterthwaite	Unequal	2.55	-0.51	0.6536
	pcb 1242	Pooled	Equal	10	9.13	<.0001
'	pcb 1242	Satterthwaite	Unequal	1.02	3.78	0.1609
	pcb 1260	Pooled	Equal	10	2.13	0.0593
	pcb 1260	Satterthwaite	Unequal	1.1	1.27	0.4103
	toc	Pooled	Equal	10	0.84	0.4211
	toc	Satterthwaite	Unequal	4.9	1.51	0.1915
	OG	Pooled	Equal	10	4.39	0.0013
	OG	Satterthwaite	Unequal	1.03	1.94	0.2970
	TRPH	Pooled	Equal	10	-3.39	0.0069
	TRPH	Satterthwaite	Unequal	1	-1.22	0.4375
		2222222333222	quu			0.43/3

Table B3		
Sand and Underflow	<b>Equality of Variance</b>	s Test Results

•				
Variable	Method	Num DF	Den DF	F Value
			_	
AS.	Folded F	9	1	1.00
CD	Folded F	9	1	36.23
CR	Folded F	1	. 9	1.32
CU	Folded F	1	9	22.22
PB	Folded F	1	. 9	13.53
HG	Folded F	1	9	Infty
NI	Folded F	9	1	1.56
SE	Folded F	1	9	
AG	Folded F	1	9	30.00
ZN	Folded F	1	9	12.10
BA	Folded F	9	1	3.16
pcb 1242	Folded F	1	9	20.35
pcb 1260	Folded F	1	9	4.26
toc	Folded F	9	1	7.32
OG	Folded F	1	9	13.75
TRPH	Folded F	1	9	117.96

Table B4 Fines (Silt/Clay) and Overflow Summary

			Lower CL		Upper CL	Lower CL		Upper CL	
Variable	TYPE	N	Mean	Mean	Mean	Std Dev	Std Dev	Std Dev	Std Err
AS	FINES	2	4.4147	5.05	5.6853	0.0315	0.0707	2.2564	0.05
AS	OVERFLOW	10	3.1251	3.445	3.7649	0.3076	0.4472	0.8165	0.1414
AS	Diff (1-2)		0.8717	1.605	2.3383	0.2969	0.4249	0.7456	0.3291
CD	FINES	2	0.6562	1.355	2.0538	0.0347	0.0778	2.482	0.055
CD	OVERFLOW	10	0.7471	0.8208	0.8945	0.0709	0.1031	0.1882	0.0326
CD	Diff (1-2)		0.3602	0.5342	0.7082	0.0705	0.1008	0.177	0.0781
CR	FINES	2	50.09	79.95	109.81	1.4827	3.3234	106.05	2.35
CR	OVERFLOW	10	43.629	48.75	53.871	4.9243	7.1592	13.07	2.2639
CR	Diff (1-2)		19.338	31.2	43.062	4.802	6.8726	12.061	5.3235
CU	FINES	2	55.555	75.25	94.945	0.978	2.192	69.948	1.55
CU	OVERFLOW	10	46.111	50	53.889	3.7398	5.4371	9.9261	1.7194
CU	Diff (1-2)		16.268	25.25	34.232	3.6365	5.2045	9.1335	4.0314
PB	FINES	2	65.623	101.2	136.78	1.7667	3.9598	126.36	2.8
PB	OVERFLOW	10	54.371	59.59	64.809	5.0183	7.2957	13.319	2.3071
PB	Diff (1-2)		29.47	41.61	53.75	4.9146	7.0337	12.344	5.4483
HG	FINES	2	3.3229	3.45	3.5771	0.0063	0.0141	0.4513	0.01
HG	OVERFLOW	10	1.1581	1.294	1.4299	0.1307	0.0141		0.0601
HG HG		10		2.156				0.3468	
	Diff (1-2)	^	1.8448		2.4672	0.126	0.1803	0.3164	0.1397
NI	FINES	2	20.747	27.1	33.453	0.3155	0.7071	22.564	0.5
NI	OVERFLOW	10	17.502	18.98	20.458	1.4207	2.0655	3.7708	0.6532
NI	Diff (1-2)	_	4.7162	8.12	11.524	1.378	1.9722	3.4611	1.5277
SE	FINES	2	-0.171	1.1	2.3706	0.0631	0.1414	4.5128	0.1
SE	OVERFLOW	10	0.5579	0.6489	0.7399	0.0875	0.1272	0.2321	0.0402
SE	Diff (1-2)	_	0.2291	0.4511	0.6731	0.0899	0.1287	0.2258	0.0997
AG	FINES	2	-0.377	0.8995	2.1765	0.0634	0.1421	4.5353	0.1005
AG	OVERFLOW	10	0.4538	0.5292	0.6046	0.0725	0.1055	0.1925	0.0333
AG	Diff (1-2)		0.181	0.3703	0.5596	0.0766	0.1097	0.1925	0.085
ZN	FINES	2	-1699	148.56	1996.6	91.769	205.69	6563.6	145.45
ZN	OVERFLOW	10	106.52	116.94	127.36	10.022	14.57	26.599	4.6074
ZN	Diff (1-2)		-83.15	31.615	146.38	46.463	66.497	116.7	51.509
BA	FINES	2	72.734	104.5	136.27	1.5774	3.5355	112.82	2.5
BA	OVERFLOW	10	71.968	79.35	86.732	7.0976	10.319	18.838	3.2631
BA	Diff (1-2)		8.1449	25.15	42.155	6.8843	9.8528	17.291	7.632
pcb_1242	FINES	2	4345.6	5927.5	7509.4	78.553	176.07	5618.4	124.5
pcb_1242	OVERFLOW	10	3642.6	4037.9	4433.2	380.1	552.61	1008.8	174.75
pcb_1242	Diff (1-2)		979.7	1889.6	2799.5	368.36	527.2	925.2	408.37
pcb_1260	FINES	2	298.44	317.5	336.56	0.9464	2.1213	67.692	1.5
pcb_1260	OVERFLOW	10	92.963	109.9	126.84	16.285	23.676	43.224	7.4871
pcb_1260	Diff (1-2)		168.82	207.6	246.38	15.701	22.471	39.436	17.406
toc	FINES	2	-66573	21100	108773	4353.6	9758.1	311382	6900
toc	OVERFLOW	10	42701	46480	50259	3633.9	5283.1	9644.8	1670.6
toc	Diff (1-2)		-35538	-2538.0	-15222	4112.4	5885.7	10329	4559.1
OG	FINES	2	-859.2	475	1809.2	66.25	148.49	4738.4	105
OG	OVERFLOW	10	351.08	435	518.92	80.688	117.31	214.16	37.096
OG	Diff (1-2)		-168.5	40	248.47	84.397	120.79	211.98	93.563
TRPH	FINES	2	-619.4	270	1159.4	44.167	98.995	3158.9	70
TRPH	OVERFLOW	10	271.76	338	404.24	63.688	92.592	169.04	29.28
TRPH	Diff (1-2)		-228.9	-68	92.945	65.157	93.252	163.65	72.233
L									

Table B5
Fines (Silt/Clay) and Overflow T-Test Results

Variable	Method	Variances	DF	t Value	Pr >  t
AS	Pooled	Equal	10	4.88	0.0006
AS	Satterthwaite	Unequal	9.99	10.70	<.0001
CD	Pooled	Equal	10	6.84	<.0001
CD	Satterthwaite	Unequal	1.8	8.36	0.0190
CR	Pooled	Equal	10	5.86	0.0002
CR	Satterthwaite	Unequal	3.39	9.56	0.0014
CU	Pooled	Equal	10	6.26	<.0001
CU	Satterthwaite	Unequal	4.26	10.91	0.0003
PB	Pooled	Equal	10	7.64	<.0001
PB	Satterthwaite	Unequal	2.68	11.47	0.0024
HG	Pooled	Equal	10	15.44	<.0001
HG	Satterthwaite	Unequal	9.44	35.40	<.0001
NI	Pooled	Equal	10	5.32	0.0003
NI	Satterthwaite	Unequal	5.53	9.87	0.0001
SE	Pooled	Equal	10	4.53	0.0011
SE	Satterthwaite	Unequal	1.35	4.19	0.0993
AG	Pooled	Equal	10	4.36	0.0014
AG	Satterthwaite	Unequal	1.23	3.50	0.1392
ZN	Pooled	Equal	10	0.61	0.5531
ZN	Satterthwaite	Unequal	1	0.22	0.8638
BA	Pooled	Equal	10	3.30	0.0081
BA	Satterthwaite	Unequal	5.53	6.12	0.0012
pcb_1242	Pooled	Equal	10	4.63	0.0009
pcb 1242	Satterthwaite	Unequal	6.16	8.81	0.0001
pcb 1260	Pooled	Equal	10	11.93	<.0001
pcb_1260	Satterthwaite	Unequal	9.6	27.19	<.0001
toc	Pooled	Equal	10	-5.57	0.0002
toc	Satterthwaite	Unequal	1.12	-3.57	0.1521
OG	Pooled	Equal	10	0.43	0.6781
OG	Satterthwaite	Unequal	1.26	0.36	0.7702
TRPH	Pooled	Equal	10	-0.94	0.3687
TRPH	Satterthwaite	Unequal	1.38	-0.90	0.4992

Table B6
Fines (Silt/Clay) and Overflow Equality of Variances Test Results

Variable	Method	Num DF	Den DF	F Value	Pr > F
AS	Folded F	9	1	40.01	0.2443
CD	Folded F	9	1	1.76	1.0000
CR	Folded F	9	1	4.64	0.6930
CU	Folded F	9	1	6.15	0.6075
PB	Folded F	9	1	3.39	0.7990
HG	Folded F	9	1	180.47	0.1154
NI	Folded F	9	1	8.53	0.5201
SE	Folded F	1	9	1.24	0.5897
AG	Folded F	1	9	1.82	0.4214
ZN	Folded F	1	9	199.30	<.0001
BA	Folded F	9	1	8.52	0.5205
pcb 1242	Folded F	9	1	9.85	0.4854
pcb 1260	Folded F	9	1	124.57	0.1389
toc	Folded F	1	9	3.41	0.1956
OG ·	Folded F	1	9	1.60	0.4747
TRPH	Folded F	1	9	1.14	0.6257

Table B7 Bulk and Feed Summary

			I arram CI		IImmon CI	Tarram OT		Transa CT	
Variable	TYPE	ı	Lower CL Mean	Mean	Upper CL Mean	Lower CL Std Dev	Std Dev	Upper CL Std Dev	Std Err
Variable			· Hean	noun	Mean	Dea Dev	Did Dev	Ded Dev	DCG HII
AS	BULK	2	0.9294	2.2	3.4706	0.0631	0.1414	4.5128	0.1
AS	FEED	10	2.1377	2.805	3.4723	0.6416	0.9328	1.7028	0.295
AS	Diff	(1-2)	-2.134	-0.605	0.9242	0.6191	0.886	1.5549	0.6863
CD	BULK	2	0.5473	0.6045	0.6617	0.0028	0.0064	0.2031	0.0045
CD	FEED	10	0.4583	0.5809	0.7035	0.1179	0.1714	0.3128	0.0542
CD	Diff	(1-2)	-0.257	0.0236	0.3042	0.1136	0.1626	0.2853	0.1259
CR	BULK	2	18.364	29.8	41.236	0.5679	1.2728	40.615	0.9
CR	FEED	10	29.449	38.44	47.431	8.6451	12.569	22.945	3.9745
CR	Diff	(1-2)	-29.23	-8.64	11.951	8.336	11.93	20.937	9.2412
CU	BULK	2	-37.08	32.8	102.68	3.4702	7.7782	248.2	5.5
CU	FEED	10	28.542	37.81	47.078	8.9111	12.955	23.651	4.0968
CU	Diff	(1-2)	-26.64	-5.01	16.623	8.7579	12.534	21.997	9.709
PB	BULK	2	33.535	43.7	53.865	0.5048	1.1314	36.102	0.8
PB	FEED	10	32.818	41.69	50.562	8.5304	12.402	22.641	3.9218
PB	Diff	(1-2)	-18.31	2.01	22.325	8.2244	11.771	20.657	9.1176
HG	BULK	2	1.0215	1.085	1.1485	0.0032	0.0071	0.2256	0.005
HG	FEED	. 10	0.6547	0.8834	1.1121	0.2199	0.3198	0.5838	0.1011
HG	Diff	(1-2)	-0.322	0.2016	0.7252	0.212	0.3034	0.5324	0.235
NI	BULK		4.4469	10.8	17.153	0.3155	0.7071	22,564	0.5
NI	FEED	. 10		15.718	19.049	3.203	4.6566	8.5012	1,4726
NI	Diff	(1-2)	-12.55	-4.918	2.7162	3.0906	4.4233	7.7626	3.4263
SE	BULK	` .		0.4995	0.5059	0.0003	0.0007	0.0226	0.0005
SE	FEED	10		0.5116	0.647	0.1302	0.1892	0.3455	0.0598
SE	Diff	(1-2)	-0.322	-0.012	0.2977	0.1254	0.1795	0.315	0.1391
AG	BULK	` ′	-2.048	0.4995	3.0471	0.1265	0.2835	9.0481	0.2005
AG	FEED	10	0.2617	0.3447	0.4277	0.0798	0.116	0.2117	0.0367
AG	Diff	(1-2)	-0.09	0.1548	0.3997	0.0992	0.1419	0.2491	0.1099
ZN	BULK		49.417	76.1	102.78	1.325	2.9698	94.768	2.1
ZN	FEED	10	62.753	81.4	100.05	17.93	26.067	47.589	8.2432
ZN	Diff	(1-2)	-48.01	-5.3	37.412	17.291	24.747	43.43	19.169
BA	BULK	2	12.99	42.85	72.71	1.4827	3.3234	106.05	2.35
BA	FEED	10	46.266	61.12	75.974	14.283	20.765	37.908	6.5664
BA	Diff	(1-2)	-52.32	-18.27	15.777	13.784	19.727	34.62	15.281
pcb_1242	BULK	2	3341.5	3754.5	4167.5	20.506	45.962	1466.7	32.5
pcb_1242	FEED	10	2356	2713.8	3071.6	344.04	500.17	913.12	158.17
pcb_1242	Diff		221.36	1040.7	1860	331.7	474.73	833.12	367.72
pcb_1260	BULK	2		39	75.848	1.8298	4.1012	130.87	2.9
pcb_1260	FEED	10	114.55	144.96	175.37	29.245	42.517	77.62	13.445
pcb_1260	Diff		-175.6	-106	-36.31	28.198	40.356	70.822	31.26
toc	BULK	2		27300	42547	757.14	1697.1	54153	1200
toc	FEED	10		26500	32529	5797	8427.9	15386	2665.1
toc	Diff		-13030	800	14630	5599.1	8013.4	14063	6207.1
OG	BULK	2		220	347.06	6.3095	14.142	451.28	10
OG	FEED	10	270.85	332	393.15	58.795	85.479	156.05	27.031
OG	Diff	(1-2)	-252.2	-112	28.171	56.747	81.216	142.53	62.909
TRPH	BULK	2		185	248.53	3.1548	7.0711	225.64	5
TRPH	FEED	10	209.04	259	308.96	48.034	69.833	127.49	22.083
TRPH	Diff	(1-2)	-188.4	-74	40.406	46.316	66.287	116.33	51.346
				···					

Table B8
Bulk and Feed T-Test Results

	**					
	Variable	Method	Variances	DF	t Value	Pr > t
	AS	Pooled	Equal	10	-0.88	0.3987
	AS	Satterthwaite	Unequal	10	-1.94	0.0807
·	CD	Pooled	Equal	10	0.19	0.8551
	CD	Satterthwaite	Unequal	9.12	0.43	0.6744
•	CR	Pooled	Equal	10	-0.93	0.3718
	CR	Satterthwaite	Unequal	9.72	-2.12	0.0608
	CU	Pooled	Equal	10	-0.52	0.6171
	CU	Satterthwaite	Unequal	2.34	-0.73	0.5313
, i	PB .	Pooled	Equal	10	0.22	0.8300
	PB	Satterthwaite	Unequal	9.61	0.50	0.6268
,	HG	Pooled	Equal	10	0.86	0.4110
	HG	Satterthwaite	Unequal	9.04	1.99	0.0775
	NI	Pooled	Equal	10	-1.44	0.1817
	NI	Satterthwaite	Unequal	10	-3.16	0.0101
	SE	Pooled	Equal	10	-0.09	0.9324
	SE	Satterthwaite	Unequal	9	-0.20	0.8443
	AG	Pooled	Equal	10	1.41	0.1894
	AG	Satterthwaite	Unequal	1.07	0.76	0.5798
	ZN	Pooled	Equal	10	-0.28	0.7878
	ZN	Satterthwaite	Unequal	9.83	-0.62	0.5474
	BA	Pooled	Equal	10	-1.20	0.2594
	BA	Satterthwaite	Unequal	9.98	-2.62	0.0257
	pcb 1242	Pooled	Equal	10	2.83	0.0178
	pcb 1242	Satterthwaite	Unequal	9.62	6.45	<.0001
	pcb 1260	Pooled	Equal	10	-3.39	0.0069
	pcb 1260	Satterthwaite	Unequal	9.67	-7.70	<.0001
	toc	Pooled	Equal	10	0.13	0.9000
	toc	Satterthwaite	Unequal	9.5	0.27	0.7902
1	OG	Pooled	Equal	10	-1.78	0.1054
	OG	Satterthwaite	Unequal	9.95	-3.89	0.0031
1	TRPH	Pooled	Equal	10	-1.44	0.1801
	TRPH	Satterthwaite	Unequal	9.72	-3.27	0.0088
			-			

Table B9 Bulk and Feed Equality of Variances Test Results

Variable	Method	Num DF	Den DF	F Value	Pr > F
·					
AS	Folded F	. 9	1	43.50	0.2343
CD	Folded F	9	1	725.01	0.0576
CR	Folded F	9	1	97.51	0.1569
CU	Folded F	9	1	2.77	0.8739
PB	Folded F	9	1	120.16	0.1414
HG	Folded F	9	1	2044.94	0.0343
NI	Folded F	9	1	43.37	0.2347
SE	Folded F	9	1	71613.0	<.0001
AG	Folded F	1	9	5.98	0.0741
ZN	Folded F	9	. 1	77.04	0.1764
BA	Folded F	9	1	39.04	0.2472
pcb 1242	Folded F	9	1	118.42	0.1424
pcb 1260	Folded F	9	1	107.47	0.1495
toc	Folded F	9	1	24.66	0.3102
OG	Folded F	9	1	36.53	0.2555
TRPH	Folded F	9	1	97.53	0.1569

# Appendix C Chemical Analysis Sample Listing, Data Validation, Raw Data Sheets

Green Bay Physical Separat Sample/Analyte	TOC/TVS/O&G/TRPH	PCBs	PAHs	Metals	Soot
Jampie/Arialyte	De	.1.,	гипъ	livietais	3001
GB Underflow 1400-1715 (-1, -2) (solids)		90808-17	N/A	90823-32	<u> </u>
GB Feed 1400-1715-1 (solids)	90848-52	90818-22	N/A	90833-37	
GB Feed 1400-1715-2 (solids)	90954-58	90924-28	N/A	90939-43	
GB Overflow 1400-1715 (-1, -2) (solids)	90944-53	90914-23	N/A	90929-38	
GB Overflow 1400-1715 -1 (supernatant)	00044 00	90853-57	N/A	90904,6,8,10,12	
GB Overflow 1400-1715 -2 (supernatant)		90883-87	N/A	90905,7,9,11,13	
GB Feed 1400-1715 -1 (supernatant)		90858-62	N/A	90894,6,8,900,02	
GB Feed 1400-1715 -2 (supernatant)		90888-92	N/A	90895,7,9,901,03	
Supply Water		90789	N/A	90893	
MetPro Underflow	92103-4	92099-100	N/A	92107-8	-
MetPro Overflow	92105-6	92101-2	N/A	92109-10	
MetPro Underflow Supernatant		92111	N/A	92113	-
MetPro Overflow Supernatant		92112	N/A	92114	
Soot Samples					92455-514
Carbon Treated Supernatant		92412	N/A	92413	
	Cell 4 Chara	cterization			
Cell 4, Bulk A,B	89589-90	89587-88	89591-92	89585-6	90795-802
Cell 4 Sand 1,2	93027-28	93023-24	N/A	93019-20	
Silt/Clay 1,2	93029-30	93025-26	N/A	93021-22	
Clay 1,2 Cell 4	94943-4	94940-1	N/A	94937-8	
Silt Cell 4	94945	94942	N/A	94939	
Soot Samples					89607-18
	Cell 5 Chara	cterization	- promp		
Bulk 1,2,3	89331-33	89343-45	89349-51	89337-39	
3ulk 4,5	89334-36	89346-48	89352-54	89340-42	
Bulk 1,2,3 <75um	89375-76	89379-80	89383-84	89371-72	
Bulk 1,2,3 >75um	89377-78	89381-82	89385-86	89373-74	
Bulk 1,2,3 >2.0 sp.gr.	89729	89725	89727	89723	
Bulk 1,2,3 <2.0 sp.gr.	89730	89726	89728	89724	
		96653		96652	

Table C2 Data Validation Summary							
Green Bay Physical Separation Samples - ECB Lab ID #s	oles - ECB Lab ID #s						
Sample/Analyte	Metals	No. of Samples	No. of Analytes	Precision 1	Accuracy 2	Completeness 3	Total Tests 4
DEMO	GROUP TOTALS			%6.66	97,3%	97.1%	
					TESTS COMPLETED		
GB Underflow 1400-1715 (-1, -2) (solids)	90823-32	10	14	140	140	140	140
GB Feed 1400-1715-1 (solids)	90833-37	2	14	20	70	70	20
GB Feed 1400-1715-2 (solids)	90939-43	ວ	15 .	75	75	75	75
GB Overflow 1400-1715 (-1, -2) (solids) 90929-38		10	15	150	150	150	150
GB Overflow 1400-1715 -1 (supernatant)	90904,6,8,10,12						
	90905,7,9,11,13						
GB Feed 1400-1715 -1 (supernatant)	90894,6,8,900,02						
GB Feed 1400-1715 -2 (supernatant)	90895,7,9,901,03						
Supply Water	90893	21	15	315	294	294	315
ed Supernatant	92413	<del></del>	14	13	4	13	14
	GROUP SUM			763	743		764
CELL 4 CHARACTERIZATION					100.0%	92.1%	
					TESTS COMPLETED		
Cell 4, Bulk A,B	89585-6	2	15	28	. 08	28	30
Cell 4 Sand 1,2	93019-20	. 2	13	•	26	22	26
Silt/Clay 1,2	93021-22	2	13	22		22	26
Clay 1,2 Cell 4	94937-38	2	15	30		30	30
Silt Cell 4	94939	<b>~</b>	15	15	15	15	15
	Missilogo			14.7		14.7	197
	שחפ החסאים			11/10/2019			

Table C2 (Concluded)							
Green Bay Physical Separation Samples - ECB Lab	ples - ECB Lab ID #s						
Sample/Analyte	Metals	No. of Samples	No. of Analytes	Precision 1 Accuracy 2		Completeness 3 Total Tests 4	Total Tests 4
CELL 5 CHARACTERIZATION	GROUP TOTALS			%9'.26	100.0% TESTS COMPLETED	%9.76	4. 2. 2.
Bulk 1,2,3	89337-39	3	14	42		42	42
Bulk 4,5	89340-42	3	14	42	42	42	42
Bulk 1,2,3 <75um	89371-72	4	14	52	56	52	56
Bulk 1,2,3 >75um	89373-74						
Bulk 1,2,3 >2.0 sp.gr.	89723	7	15	30	30	30	30
Bulk 1,2,3 <2.0 sp.gr.	89724						
							1
	GROUP SUM			166		166	170

Precision 1 The number of tests completed whose relative percent differences (RPDs) fell within the test's acceptance criteria.

Accuracy 2 The number of tests completed whose percent recoveries (% R) fell within the test's acceptance criteria.

Completeness 3 The number of tests completed or that had acceptable QC including 1 and 2 above. Total Tests 4 The number of analytes multiplied by the number of samples.

Bampler : (Signeture)  Bampler : (Signeture)				٢,	(ER 1110-1-263)
da10 qmo2	Mobiled				
Grab Grab Grab	1	to ledm eleniate	100 P	V DOTE	
1	Code/Sample Number	PO Nn	/ S		Romarks:
S. S. J. G. B. S.	From .	$\omega$	XX	/	
18.25 X 6.8	رم	8	XX		
13:5 X K 6.8 FEET	0	3	$X \mid X$		
(6 5 ) X X X X X X X X X X X X X X X X X X	(a)	8	×		
<b>Y Y Y Y Y Y Y Y Y Y</b>	6.8 Sucartion	8	×		
89 87 3	ارعده	<b>\</b>	×		
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	s.e.	(>)	X		
(6.8. Werka)	жкал	Ø	X X		
0.8.6 X X 3.0	رجوه	M	×		
Sampler Relinquiened by:	Received by: (819.)	(819.)	in Co	8-10 1852	Hazarda Associated with Samples
Relinquished by: (819.)		(819.)		Date/Time	
Relinquiehed by: (Sig) Date (Time	Received for Laboratory by: (8(g.)	. (3/8.)		Date/Time	Remarks at lime of receipt:
ustody Sezi No.	Lab cass No.:	<b>.</b>			
EMG Form 5021-R, Oct 90	N. S.				Proponent: CEMP-RT

### ### ##############################	U.S. Army Corps of Ei	Sd	ngine	ers		•		:	Chain of Custody-Record
		201	2/2	PLOBIC &			The second	150	
	Sampler : (Signatute)				to tedm stenial:		NO LA	Chi.	
	Time Pres.		Site Co	10 Number	H UI	VJ V	(M∈	Tiely	Romarks:
	31910 1455	×	D MS CHARA	きいずく		X	<u> </u>		
X SUMPLEY XX CELL 4 CHANGERIAND 3 X X X CHANGE TO CHANGE	/	X	οΩ	S#noo		X	$\times$		
X SAM ANTER 1 XX X X X X X X X X X X X X X X X X X	Philosof	×	- 6	हु: १९५८ स्टूडिस्ट १५ इस्ट १५० च	8	X			
	C × 1			TER					
	4   -		JAS NASAIO JASSELA	7	$(\!$	X			
X G.B. SAY (G.R) S X X  X G.B. SAMPLOD S X X  X G.B. SAMPLOD S X X  Date/Time Parented by: (81g.)  Date/Time Received by: (81g.)  Date/Time Received for (81g.)  Date/Time Received for (81g.)  Lab case No.:  Date/Time Remarks at time of receipt:  Date/Time Remarks at time of receipt:  Date/Time Remarks at time of receipt:	The second		F. C.	~	3	X			
C. B. OLOSCAFCOLOS   S. X   X   C. B. OLOSCAFCOLOS   S. X   X   X   X   X   X   X   X   X   X	1000		CALLEN BA	14 (G.B)	8	×	<u> </u>		
C. B. Out   C. B			6. B Underfa	לאס	N	ίX			
Date/Time Beceived by: (81g.)  Date/Time Received by: (81g.)  Date/Time Received by: (81g.)  Date/Time Received by: (81g.)  Laboratory by: (81g.)  Lab case No.:  Lab case No.:  Date/Time Remarks at time of receipt:  Lab case No.:  Date/Time Remarks at time of receipt:  Date/Time Remarks at time of receipt:			6.8 DENF	, G	Μ	×			
Daie/Time Received by: (Sig.)  Daie/Time Received by: (Sig.)  Daie/Time Received by: (Sig.)  Daie/Time Received for Boate/Time Remarks at time of receipt:  Laboratory by: (Sig.)  Date/Time Remarks at time of receipt:  CCT 90  Date/Time Remarks at time of receipt:	N N N	<del>-</del>	6.B (CE)	^	W	X			
1g.) Daie/Time Received by: (Sig.) Daie/Time Remarks at time of receipt:  Laboratory by: (Sig.)  Lab case No.:  Cct. 90  Proponent:	Sellnquished by:		Date/Time	Bacelved by:	1310.1	0	0\0 2/.0		Hazarda Associated with Samples
Laboratory by: (81g.)  Lab case No.:  Oct 90	Relinquished by: (Sig.)		Date/Time	Received by:	(319.)		Date	. (Time	
Oct 90	Relinquished by: (Sig)		Date / Time	Received for Laboratory by:	(819.)		Date	/Time	Remarks at time of receipt:
Oct 90	Duelody Seal No.		:	•					
			***************************************				***************************************	- Andread - Andr	i

TOB	DESCRIPTION: CD	EEN DAY	MODILE TOTAL	PLANT -OLIN-ESTES	100 : 111 510 50	205122 0071217	
CHEM. P	RESERVATIVE:	CEN DAI	HOOLEE ININ	ACMI ACTIVATEDITES	TYPE OF SAMPLE:	0054PD-92310183 SEDIMENT	RECEIPT DATE: 02 COMPLETION DATE: 22
	COLUMN		.1	2	3		
	ANALYTE.		86	100	104		
	MG/KG	•••••	TOC	0&G	HANT		
SAMP #	DESCRIPTION			•			
89331	BULK 1,2,3-1	CONC	51000	[ 250	120		
•	5/30/00 10:30	%REC		j	i i		
	GB/BP CDF	DUPL	48800	ŀ	ĺ		
y, i		OID	10040158	55990172	55990172		
89332	BULK 1,2,3-2	CONC	4830d	[ 200	100		
	5/30/00 10:30	%REC		i	1		
	GB/BP COF	DUPL	and the first	İ	i i		
		OID	10040158	55990172	55990172		. *
89333	BULK 1,2,3-3	CONC	46400	190	98		
	5/30/00 10:30	XREC					
	GB/BP CDF	DUPL		j	i i		
		DID	10040158	55990172	55990172		
89334	BULK 4,5-1	CONC	43900	į 150	1 82		
	5/26/00 15:30	XREC		1	100		
	G8/8P CDF	DUPL		,	i i		
		OID	10040158	55990172	55990172		
89335	BULK 4,5-2	<sub>CDN</sub> C	43800	140	1 70	<b>6</b> 0	
	5/26/00 15:30	XREC	45000	1 140	74		
	GB/BP CDF	DUPL		Ï	i i		
		OID	10040158	55990172	55990172		
89336	DIRV A EST			1	s e e		•• !
٥١٥٥٥	BULK 4,5-3 5/26/00 15:30	CONC %REC	46800	150	78		
	GB/BP CDF	DUPL		1			
		010	10040158	55990172	55990172		
TOC	Total Organic (	Carbon			O&G Oil and G	rease	
TRPH	Total Recoveral	ble Pcti	roleum Hydroca	irbons			

DATE: 22 JUI JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIM-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 02 JUN EM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 22 JUL COLUMN...... 1
ANALYTE..... 86 2 3 100 104 MG/KG..... TOC 0&G TRPH SAMP # DESCRIPTION BL#01 METHOD BLANK 01 CONC <100 <35 <35 %REC DUPL 010 10040158 4, , 55990172 55990172 BL#02 LCS 01 CONC 8927 922 935 %REC 89.3 90.7 92.0 DUPL 010 10040160 55990172 55990172 BL#03 EXTERNAL QC 01 CONC 18672 N/A XREC DUPL OID 10040158 55990165 55990167 TOC Total Organic Carbon Oil and Grease 0&G TRPH Total Recoverable Petroleum Hydrocarbons

Kright E: 89337 DATE: 22 JE JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES JOB NUMBER: 0054P0-92310183 RECEIPT DATE: 02 JU CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 22 JU COLUMN..... 1 2 3 6 ANALYTE..... 2 6 7 8 MG/KG..... AS CR cu P8 ЖG SAMP # DESCRIPTION 89337 BULK 1,2,3-1 CONC 3.28 0.895 52.9 51.7 63.2 0.965 5/30/00 10:30 XREC 91.2 79.4 86.4 85.6 101.6 107.5 GB/BP CDF DUPL 3.38 0.895 52.1 51.1 64.2 0.989 DID 01260172 01260172 01260172 01260172 01260172 04650168 ر اور د این RGA AUTH HGA AUTH HGA AUTH HGA AUTH 89338 BULK 1,2,3-2 CONC 3.31 0.911 56.6 55.6 65.3 1.02 5/30/00 10:30 ZREC GB/BP CDF DUPL OID 01260172 01260172 01260172 01260172 01260172 04650168 HGA AUTH HGA AUTH HGA AUTH HGA AUTH 89339 BULK 1,2,3-3 CONC 2.79 0.858 47.2 49.3 63.6 0.997 5/30/00 10:30 %REC GB/BP CDF DUPL OID 01260172 01260172 01260172 I 01260172 01260172 04650168 HGA AUTH HGA AUTH HGA AUTH HGA AUTH 89340 BULK 4,5-1 CONC 3.28 0.875 1 51.8 47.6 63.1 1.02 5/26/00 15:30 XREC GB/BP CDF DUPL OID 01260172 01260172 01260172 01260172 01260172 04650168 HGA AUTH HGA AUTH HGA AUTH HGÀ AUTH 89341 BULK 4,5-2 CONC 3.10 0.871 1 49.9 48.7 66.1 1.03 5/26/00 15:30 %REC GB/BP CDF DUPL 01260172 01260172 01260172 01260172 01260172 04650168 HGA AUTH HGA AUTH HGA AUTH HGA AUTH 89342 BULK 4,5-3 CONC 3.48 1.07 58.3 50.5 77.1 1.00 5/26/00 15:30 XREC GB/BP CDF DUPL 010 01260172 01260172 01260172 01260172 04650168 01260172 HGA AUTH HGA AUTH HGA AUTH HGA AUTH AS Arsenic CD Cadmium ĊR Chromium cu Copper PB Lead Mercury

:	E: 89337									DATE:	
*****	*****	*****	ENVIRONMENTAL	. CHI	EMISTRY BRANCH	- DATA REP	ORTING S	SHEET ( PAGE	2 OF 6 ) ****	*********	*****
	DESCRIPTION: GREE RESERVATIVE:	EN BAY	MOBILE TRIMT	PU	NNT -OLIN-ESTES			ER: 0054PD-97 LE: SEDIMENT		RECEIPT DATE:	
	COLUMN		1		2	3		4	5	6	
	ANALYTE MG/KG				* 4 CD	5 CR		6 CU	7 PB	8. Kg	
		•••••	<b>N</b> 5			- CN		00	, 5		
SAMP #	DESCRIPTION										R
BL#01	METHOD BLANK 01	CONC XREC	<0.200	ĺ	<0.020	<0.100 	!	0.200	<0.100	<0.040	l
		DUPL	01260172		01260172	0126017	2   2	01260172	01260172	04650168	-
			01200112	,	HGA AUTH	HGA AUT		HGA AUTH	HGA AUTH	1 0.050.00	'
BL#02	LCS 01	CONC	4.30	ļ	2.40	9.90	1	10.2	5.80	0.0757	1
		%REC DUPL		į	100.4	99.1	ļ	102.0	116.8	100.9	į
		OID	01260172		01260172	0126017	2	01260172	01260172	04650168	ľ
				,	HGA AUTH	HGA AUT	H	HGA AUTH	HGA AUTH		
BL#03	EXTERNAL QC 01	CONC	76.8		32.2	12.4		87.5	[ 1150 1	0.050	l
		DUPL							040/0470	04650168	ij,
		OID	01260172	1	01260172 HGA AUTH	1 0126017 HGA AUT		01260172 HGA AUTH	01260172   HGA AUTH	1 04000 100	,
AS CR	Arsenic Chromium					CD	Cadmin Copper	•			
PB	Lead			. ;		HG	Kercu	гу	17		
					•				•		
				1							
				ļ							•
										•	
				4							
				4							

TO ME JOB FILE: 89337 DATE: 27 JU JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 02 JU CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 27 JUA COLUMN..... 7 8 9 10 11 12 ANALYTE..... 9 10 11 13 25 -30 MG/KG......NI SE. AG ZN ŘΑ FE DESCRIPTION 89337 BULK 1,2,3-1 CONC 21.2 1 0.895 0.397 150 1 80.2 1 16700 5/30/00 10:30 %REC 87.8 82.0 83.4 93.2 103.6 115.0 GB/BP COF. DUPL 20.6 0.895 0.497 153 83.3 17000 OID 01260172 01260172 01260172 01260173 01260172 01260173 HGA AUTH HGA AUTH 89338 BULK 1,2,3-2 CONC 24.4 1.00 0.501 142 92.0 | 17300 5/30/00 10:30 XREC GB/BP CDF DUPL Q10 01260172 01260172 01260172 01260173 01260172 01260173 HGA AUTH HGA AUTH 89339 BULK 1,2,3-3 CONC 19.3 0.898 0.399 138 75.9 14900 5/30/00 10:30 XREC GB/BP COF DUPL OID 01260172 01260172 01260172 01260173 01260172 01260173 HGA AUTH HGA AUTH 89340 BULK 4,5-1 CONC 20.0 1.09 0.597 135 80.9 16400 5/26/00 15:30 XREC GB/BP CDF DUPL OID 01260172 01260172 01260172 01260173 01260172 01260173 HGA AUTH HGA AUTH 89341 BULK 4,5-2 CONC 19.7 1.10 0.400 139 75.3 15000 5/26/00 15:30 ZREC G8/8P CDF DUPL DID 01260172 01260172 01260172 01260173 01260172 01260173 HGA AUTH RGA AUTH 89342 BULK 4,5-3 CONC 21.9 0.995 0.597 1 154 88.9 1 17500 5/26/00 15:30 **XREC** GB/BP CDF DUPL ÖIÖ 01260172 01260172 01260172 01260173 01260172 01260173 HGA AUTH HGA AUTH ΝI Nickel SE Selenium AG Silver ZN Zinc BA Barium FE 1 ron

****	******	*****	EWII DOMINING					DATE:	55
•			ENVIKUMMENTA	AL CHEMISTRY BRANCH	- DATA REPORT	ING SHEET ( PAG	E 4 OF 6 )	*****	****
JC	OB DESCRIPTION: G	REEN BAY	Y MOBILE TRIM	T PLANT -OLIN-ESTE	9 100 1				
CHEM	PRESERVATIVE:					IUMBER: 0054PD- SAMPLE: SEDIMEN		RECEIPT DATE: COMPLETION DATE:	02 <b>2</b> 2
	COLUMN			8	9	10	11	12	
	ANALYTE. MG/KG		-	10 SE	11	13	25	30	
SAMP ;		•	•	SC.	AG	2N	BA	FE	
BL#01									
DC#Q1	METHOD BLANK O	TONC		<0.200	<0.100	<1.00	<0.100	<2.00	
		DUPL		i				<b>!</b>	
\$ 1		010	01260172 Hga Auth	01260172	01260172 HGA AUTH	01260173	01260172	01260173	
BL#02	LCS 01	CONC	10.5	1.90	2.40	20.0	1 24 7	1	
			105.0	74.4	95.6	80.0	24.7   98.8	55.0   110.0	ļ
		JUPL 010	01260172	01260172	01260172	1 012/04~	į	į	
			HGA AUTR	,	HGA AUTH	01260173	01260173	01260173	١
BL#03	EXTERNAL QC 01	CONC	13.0	1.49	3.58	274	182	13600	ı
		%REC OUPL		1	1	! .	1	į	j
		010	01260172 HGA AUTH	01260172	01260172 HGA AUTH	01260173	01260173	01260173	]
ĸı	Nickel				SE Sel	enium			
AG BA	Silver Barium				ZN Zin	<b>c</b>			
	,				FE Iron	1			
							$\lambda_{i}$		
	÷					•			

```
JOB FILE: 89337
                                                                                     DATE: 22 JUN
 JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES
                                                   JOS NUMBER: 0054PD-92310183
                                                                             RECEIPT DATE: 02 JUN
CHEM. PRESERVATIVE:
                                                TYPE OF SAMPLE: SEDIMENT
                                                                            COMPLETION DATE: 22 JUN
           COLUMN...... 13
                                   14
           ANALYTE..... 32
                                   33
           MG/KG..... MN
                                   MO
SAMP #
      DESCRIPTION
       METHOD BLANK D1 CONC <0.100
BL#01
                   %REC
                   DUPL
                   OID 01260173
                                  01260172
                       HGA AUTH
BL#02
      LCS 01
                   CONC 9.90
                                  4.50
                   %REC 99.4
                                  90.0
                   DUPL
                                  01260172
                   010 01260173
                       HGA AUTH
BL#03
      EXTERNAL QC 01 CONC 452
                                  0.299
                   %REC
                   DUPL
                   010 01260173
                                  01260172
                       HGA AUTH
MN
       Manganese
                                                     Molybdenum
```

	ESCRIPTION: GREE	EN BAY P	MOBILE: TRIMI	PLANT FOLIN-ESTES		MBER: 0054PD-923 MPLE: SEDIMENT		RECEIPT DATE: 02	NUL S
	COLUMN		1	2	.3	4	5	6	
•	ANALYTE			138 pcg-1221	139 PCB-1232	140 PCB-1242	141 PC9-1248	142 PCB-1254	
	UG/KG		PCB-1010	PCB-1221	PLB- 1232	FUD" ISTS	F-00- 1E-10	FUB 1654	
AMP #	DESCRIPTION								.,
39343	BULK 1,2,3-1	CONC	<24.8	<24.8	<24.8	1261	<24.8	<24.8	1
	5/30/00 10:30	<b>XREC</b>	111.6	Ì	İ	į.	į.	:	!
	GB/BP CDF	DUPL	FIOTOSE	   54830166	54830166	54830166	54830166	54830166	.
		OID	54830166	34030100	34030100	1 24000 (00)	1 24020.00	1 22000:00	J
89344	BULK 1,2,3-2	CONC	<24.3	<24.3	<24.3	1083	<24.3	<24.3	1
ייינלנ	5/30/00 10:30	%REC	727.3				j .=	Ť	į
	GE/BP CDF	DUPL		j		1 54070144		1 5/970144	1
		OID	54830166	54830166	54830166	54830166	54830166	54830166	.1
			54.0	1 -21 9	f -1/ 0	Lasza	<24.8	<24.8	ï
89345	BULK 1,2,3-3 5/30/00 10:30	CONC *REC	<24.8	<24.8	<24.8	1140	524.0	1	ľ
	GB/BP CDF	DUPL			1	į.	i	i	į
j.		010	54830166	54830166	54830166	54830166	54830166	54830166	ļ
•				-					
89346	BULK 4,5-1	CONC	<22.4	<22.4	<22.3	1160	<22.4	<22.4	1
	5/26/00 15:30 GB/BP CDF	ZREC				i	r F		i
		010	54830166	54830166	54830166	54830166	54830166	54830166	4
89347	BULK 4,5-2		<23.0	<23.0	<23.0	1378	<23.0	<23.0	Į.
	5/26/00 15:30 GB/BP CDF	XREC DUPL				1	Ì	İ	- 1
	db/ br ob.	OID	54830166	54830166	54830166	54830166	54830166	54830166	İ
									,
89348	BULK 4,5-3		<22.1	i <22.1	<22.1	1384	<22.1	<22.1	Ì
	5/26/00 15:30 GB/BP CDF	XREC DUPL		 		1	l. I	l. 	ľ
	db/or oo.	010	54830166	54830166	54830166	54830166	54830166	54830166	Ì
PC8-1016	PCB-1016				PCB-1221 PCB			•	
	PCB-1232				PCB-1242 PCB				
PCB-1248	PCB-1248				PC8-1254 PC8	3-1234			

DATE: 16 JUN [ JOB 'FILE: 89343 RECEIPT DATE: 02 JUN C . JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES JOB NUMBER: 8054PD-92310183 TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 16 JUN C CHEM. PRESERVATIVE: 5 COLUMN...... 1 2 140 142 ANALYTE..... 137 138 139 141 PCB-1242 PC8-1248 PC8-1254 UG/KG..... PCB-1016 PCB-1221 PCB-1232 SAMP # DESCRIPTION RC | <8.33 <8.33 <8.33 BL#01 METHOD BLANK 01 CONC <8.33 <8.33 <8.33 %REC DUPL 54830166 54830166 54830166 54830166 54830166 010 54830166 BL#02 LCS 01 CONC 0.82 N/A N/A N/A N/A N/A %REC 98.4 DUPL 54830166 54830166 54830166 54830166 54830166 010 54830166 PC8-1221 PC8-1221 PCB-1016 PCB-1016 PCB-1232 PCB-1232 PC8-1242 PC8-1242 PCB-1254 PCB-1254 PCB-1248 PCB-1248

JOB FILE: 89343 DATE: 16 JUN C E JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 02 JUN C TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 16 JUN C CHEM. PRESERVATIVE: COLUMN...... 7 8 145 ANALYTE..... 143 146 UG/KG..... PCB-1260 TCLXYL-\$ SAMP # DESCRIPTION BL#01 METHOD BLANK 01 CONC <8.33 87.1% 81.1% XREC DUPL 54830161 54830166 OID 54830161 BL#02 LCS 01 CONC 0.87 77.4% 78.6% XREC 104.4 DUPL 54830166 OID 54830161 54830161 TclXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS PC8-1260 PCB-1260 DCLBP Decachlorobiphenyl(Surrogate (60-150 WS))

	ECB Quality Assu	rance Corrective Actio	on Form
	•		
Analysis:	PCB	Date:	15-June-00
Analyst:	A. Morrow		5890 #83 GC
D. III			
Problem:	There is PCB's present, not su	ure if it is 1242 or 1248	
Sample Nur	nber(s) Affected: 89343	-89348	
5 5 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Recommend	ded Corrective Action: Repor	t as 1242 and do further study.	
•			•
		N	
			•
			;
Corrective A	Action Taken By Analyst: Same	as above.	
	•		· •
Comments:	There will be further clean up.	and analyses done to better quan	diffete and
Comments.	qualitatively identify sample co	**	ilitale and
Reviewed by		5-June-00 () ( ann	
· · · · · · · · · · · · · · · · · · ·			
2-February-96			c:\caf\cafform

Jobfile Number: 89343
Project: GREEN BAY MOBILE TRTMT PLANT -OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 02 JUN 00

b# Sample 1	Tst Analyte	% REC	% SDUPL	RPD	OID
343 89343 1 343 89343 1	137 PCB-1016 143 PCB-1260 145 TclXYL-S	88.4	77.2 85.2 80.5 73.0	3.7 4.8	54830166 54830161 54830161 54830166

Page 1

END OF REPORT

JOB FILT: 89749 DATE: 13 JUN \*\*\*\*\*\*\*\*\*\*\* ENVIRONMENTAL CHEMISTRY BRANCH - DATA REPORTING SHEET ( PAGE 1 OF 8 ) \* JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES JOB NUMBER: 0054PD-92310183. RECEIPT DATE: 02 JUN CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 13 JUN COLUMN...... 1 5 6 ANALYTE..... 290 294 296 297 303 304 UG/KG..... NAPHTH ACENAY ACENAP FLUORE PHENAN ANTRAC SAMP # DESCRIPTION 89349 BULK 1,2,3-1 CONC 163 10 J 19 J 40.0 258 45.9 5/30/00 10:30 %REC GB/BP CDF DUPL Oto 08890160 08890160 08890160 08890160 08890160 08890160 89350 BULK 1,2,3-2 **CONC** 195 111 J 1 22.0 44.9 275 1 50.7 5/30/00 10:30 %REC GB/BP CDF DUPL DID 08890160 08890160 08890160 08890160 08890160 08890160 89351 BULK 1,2,3-3 CONC 138 8.9 J 23.8 42.6 275 52.5 5/30/00 10:30 XREC GB/BP CDF DUP1 OID 08890160 08890160 08890160 08890160 08890160 08890160 89352 BULK 4,5-1 CONC 157 9.8 1 15 J 38.5 1 213 35.8 5/26/00 15:30 XREC. GB/BP COF DUPL 08890160 08890160 08890160 08890160 08890160 010 08890160 89353 BULK 4,5-2 **CONC** 113 8.2 J 1 14 3 33.0 | 218 40.3 5/26/00 15:30 ZREĆ GB/BP CDF DUPL 08890160 08890160 08890160 08890160 OID 08890160 08890160 89354 BULK 4,5-3 CONC 104 9.0 1 | 14 J 37.0 1 229 43.4 5/26/00 15:30 %REC 90.0 74.0 79.5 89.0 102.5 90.0 GB/BP CDF DUPL 010 08890160 1 08890160 08890160 08890160 08890160 08890160 NAPHTH Naphthalene ACENAY Acenaphthylene ACENAP Acenaph thene FLUORE Fluorene PHENAN Phenanthrene ANTRAC Anthracene

JOB #114: 89349 DATE: 13 JUN JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 02 JUN CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 13 JUN 1 COLUMN..... 1 2 3 5 ANALYTE..... 290 294 296 297 303 304 UG/KG..... NAPHTH ACENAY ACENAP FLUORE PHENAN ANTRAC SAMP # DESCRIPTION BL#01 METHOD BLANK 01 CONC <10 <10 <10 | <10 | <10 **XREC** DUPL. 010 08890160 08890160 08890160 08890160 08890160 08890160 BL#02 LCS 01 CONC 64.5 64.0 76.0 80.5 88.5 85.5 %REC 64.5 64.0 76.0 80.5 88.5 85.5 DUPL 01D 08890160 08890160 08890160 08890160 08890160 08890160 NAPHTH Naphthalene **ACENAY** Acenaphthylene ACENAP Acenaphthene FLUORE Fluorene PHENAN Phenanthrene ANTRAC Anthracene 1 1%

			•	•		ING SHEET ( PAG		*******	
CHEM.	DESCRIPTION: GF PRESERVATIVE:	REEN BAY	MOBILE TRIM	T PLANT -OLIN-ESTE		NUMBER: 0054PD-9 SAMPLE: SEDIMENT		RECEIPT DATE:	02 J
	€OLUMN		7	Ä	9	10	<b>.11</b> .	•	
	ANALYTE.			307	309	310	313	12	
	UG/KG	••••••	FLANTHE	PYRENE	CHRYSE	BAANTHR	BBFLART	314 BKFLANT	
SAMP #	DESCRIPTION								
89349	BULK 1,2,3-1	CONC	417	369	253	187	Lanz	1.20	
	5/30/00 10:30	XREC		i	1	1 101	186	147	- 1
	GB/BP CDF	DUPL		i	i	}	i I	į	- [
		OID	08890160	08890160	08890160	08890160	08890160	08890160	- [
89350	BULK 1,2,3-2	CONC	388	1 465	272	197	1 405	•	
	5/30/00 10:30	%REC			1	1 124	185	143	!
	G8/8P CDF	DUPL		i	i	i	ļ	ļ	_ !
		CID	08890160	08890160	08890160	08890160	08890160	08890160	1
89351	BULK 1,2,3-3	CONC	359	1 341	F 244	•			
	5/30/00 10:30	*REC	337	] 341 ]	j 218	157	149.	127	- 1
	GB/BP CDF	DUPL			ļ ` .		ļ	I	Ĩ
		Dip	08890160	08890160	08890160	08890160			- 1
		•		, ,	1 200/2100	1 80930100	08890160	08890160	l
39352	BULK 4,5-1	CONC	293	290	] 189	131	125	1 97.6	
	5/26/00 15:30	XREC			İ	į	1	1	1
	GB/BP CDF	DUPL		Ĺ	J	1	i ·	1	- 1
		OID	08890160	08890160	08890160	08890160	08890160	08890160	i
19353	BULK 4,5-2	CONC	327	309	l 195	146	128	Laige	
	5/26/00 15:30	XREC		ĺ	i	† '' <b>'</b>	1 120	108	1
	GB/BP CDF	DUPL		j	ŀ	í	i	4	4
		010	08890160	08890160	08890160	08890160	08890160	08890160	
9354	BULK 4,5-3	CONC	308	1.305	193	Ĭ 170	f. 400:	•	i
	5/26/00 15:30		132.0	130.0	118.5	139 101.0	129	96.7	Ţ
	GB/BP CDF	DUPL				1 101.0	106.5	80.0	- [
		010	08890160	08890160	08890160	08890160	08890160	08890160	1
LANTHE	Fluoranthene			•	Duneus -	*.		•	
HRYSE	Chrysene				PYRENE Pyre				
BFLANT	Benzo(b)Fluorar				BAANTHR Benz	ro(a)Anthracene		*	

ţ JOB FILE: 89349 DATE: 13 JUN ARREST STATES AND ARREST AND ARREST AND ARREST AND ARREST ARREST AND ARREST ARR JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES 1 JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 02 JUN CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 13 JUN COLUMN..... 7 8 10 12 ANALYTE..... 306 307 309 313 310 314 UG/KG..... FLANTHE PYRENE CHRYSE BAANTHR BBFLANT BKFLANT SAMP # DESCRIPTION BL#01 METHOD BLANK 01 CONC <10 | <10 <10 <10 | <10 <10 XREC DUPL 010 08890160 08890160 08890160 08890160 08890160 08890160 BL#02 LCS 01 CONC 91.5 87.0 97.5 85.0 78.5 88.0 %REC 91.5 87.0 97.5 85.0 78.5 88.0 DUPL 010 08890160 08890160 08890160 08890160 08890160 08890160 FLANTHE Fluoranthene PYRENE CHRYSE Chrysene BAANTHR Benzo(a)Anthracene BBFLANT Benzo(b)Fluoranthene BKFLANT Benzo(k)Fluoranthene  $C_{i}^{\prime}$ 

*****	********	*****	ENVIRONMENTAL	CHEMISTRY BRANCH	- DATA: REPORTI	NG SKEET ( PAGE	5 OF 8 )	*******	*****
JOB CHEM. P	DESCRIPTION: GR RESERVATIVE:	EEN BAY	MOBILE TRIMT	PLANT -OLIN-ESTES		UMBER: 0054PD-92 AMPLE: SEDIMENT	2310183	RECEIPT DATE: COMPLETION DATE:	02 JU
	COLUMN		13	14	15	16	17	40	
	ANALYTE.		315	316.	. 317	318	322	18 327	
	UG/KG		BAPYRE	.1123PYR	DBAHANT	B-GHI-PY	2MeNAPH	2FIBP-S	
SAMP #	DESCRIPTION								
89349	001111111111111111111111111111111111111								
07347	BULK 1,2,3-1 5/30/00 10:30	CONC	:205	174	25.4	188	162	79.0%	ĺ
	GB/BP COF	%REC OUPL			. <b>!</b>	Į.	Ţ	Į	İ
	40704 (607	1400	08890160	08890160	L DESCRIPT	1 200000440		Ţ.	Ì
		, 010	00070100	1 00030 180	08890154	08890160	08890160	08890160	ł
89350	BULK 1,2,3-2 5/30/00 10:30 GB/BP CDF	CONC TREC	207	176 	30.6	185	] 174	76.2%	-
	dayar cur	OID	08890160	08890160	08890154	08890160	08890160	08890160	-
89351	BULK 1,2,3-3 5/30/00 10:30	CONC	168	143	31.7   `	165	137	72.2%	!
	GB/BP CDF	DUPL	08890160		Į	1	1 , ,	ĺ	i
j		010	ńodźnion	08890160	08890154	08890160	08890160	08890160	Ï
89352	BULK 4,5-1	CONE	145	118	26.9		No exact	2	
	5/26/00 15:30 GB/BP CDF	XREC DUPL	110		]   	150 	154	74.8%	
		CID	08890160	08890160	08890154	08890160	08890160	08890160	1
89353	BULK 4,5-2	CONC	152	125	27.5	148	118	67.7%	t.
	5/26/00 15:30 GB/BP CDF	%REC DUPL		ļ,	1	į	İ	i i	ľ
	CO/OF COF		08890160	08890160	   08890154	   08890160	08890160	08890160	1
89354	BULK 4,5-3		150	122	25.3	149	119	65.9%	4 -
	5/26/00 15:30	%REC	101.0	106.5	95.0	100.5	97.5	71.7	j
	GB/BP CDF	DUPL	00000470	l anana		1	1	Ï	j
		OID	08890160	08890160	08890154	08890160	08890160	08890160	Ì
BAPYRE	Benzo(a)Pyrene				I123PYR Ind	eno(1,2,3-C,0)Pyr	ene		
THAHABD	Dibenzo(A,H)Ani 2-Methylnaphtha	thracene slene	1		B-GRI-PY Ben	zo(G,H,l)Perylene luorobiphenyl(Sur		5-\$))	
	-								
:									
					•				

JOB 11: E: 89349 DATE: 13 JC JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 02 JU: CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 13 JUN COLUMN...... 13 15 17 16 ANALYTE..... 315 316 317 318 322 327 UG/KG..... BAPYRE 1123PYR DBAHANT B-GHI-PY 2MeNAPH 2FIBP-S SAMP # DESCRIPTION METHOD BLANK 01 CONC <10 <10 | <10 1 82.6% XREC DUPL 08890160 010 08890160 08890154 08890160 08890160 08890160 LCS 01 CONC 74.5 87.0 85.5 91.0 65.5 73.7% %REC 74.5 87.0 85.5 91.0 65.5 DUPL 010 08890160 08890160 08890154 08890160 08890160 08890160 BAPYRE Benzo(a)Pyrene I123PYR Indeno(1,2,3-C,D)Pyrene

DBAHANT Dibenzo(A, H)Anthracene

2MeNAPH 2-Methylnaphthalene

B-GHI-PY Benzo(G, H, I)Perylene

2FIBP-S 2-Fluorobiphenyl(Surrogate (30-115 S))

```
DATE: 13 JUN
JOB FILE: 85349
RECEIPT DATE: 02 JUN
                                                       JOB NUMBER: 0054P0-92310183
  JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES
                                                                                  COMPLETION DATE: 13 JUN
                                                   TYPE OF SAMPLE: SEDIMENT
CHEM. PRESERVATIVE:
            ANALYTE..... 328
            UG/KG..... PTERP-S
      DESCRIPTION
SAMP #
                     CONC 77-7%
89349
       BULK 1,2,3-1
                     %REC
       5/30/00 10:30
                     DUPL
        GB/BP CDF
                     OID
                         08890160
 89350
        BULK 1,2,3-2
                     CONC 92.9%
                     XREC
        5/30/00 10:30
        GB/BP CDF
                     OID 08890160
                     CONC 78.4%
 89351
        BULK 1,2,3-3
        5/30/00 10:30
                     XREC
                      DUPL
        GB/BP CDF
                      010
                          08890160
                      CONC 78.9%
 89352
        BULK 4,5-1
                      XREC
        5/26/00 15:30
        GB/BP CDF
                      DUPL
                      OID:
                          08890160
 89353
        BULK 4,5-2
                      CONC 76.4%
                      XREC
        5/26/00 15:30
         GB/BP CDF
                      DUPL
                      OID
                          08890160
 89354
                      CONC 80.5%
         BULK 4,5-3
                      %REC 79.0
         5/26/00 15:30
                      DUPL
         GB/BP CDF
                          08890160
                      OID
  PTERP-S p-Terphenyl-D14(Surrogate (18-137 S))
```

JOB FILE: 89349 DATE: 13 JUN JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLANT -OLIM-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 02 JUN CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 13 JUN COLUMN...... 19 ANALYTE..... 328 UG/KG..... PTERP-S SAMP # DESCRIPTION BL#01 METHOD BLANK 01 CONC 76.6% \*REC DUPL 010 08890160 BL#02 LCS 01 CONC 70.8% **XREC** DUPL 010 08890160 PTERP-S p-Terphenyl-D14(Surrogate (18-137 \$))

Jobfile Number: 89349
Project: GREEN BAY MOBILE TRIMT PLANT -OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 02 JUN 00

Job#	Sample	Tst	Analyte	% REC	% SDUPL	RPD	OID
89349	89354	290	NAPHTH	90.0	76.0	16.9	08890160
89349	89354	294	ACENAY	74.0	72.0	2.7	08890160
89349	89354	296	ACENAP	79.5	78.0	1.9	08890160
89349	89354	297	FLUORE	89.0	88.5	0.6	08890160
89349	89354	303	PHENAN	102.5	97.0	5.5	08890160
89349	89354	3.04	ANTRAC	90.0	90.0	0.0	08890160
89349	89354	306	FLANTHE	132.0	126.5	4.3	08890160
89349	89354	307	PYRENE	130.0	114.0	13.1	08890160
89349	89354	309	CHRYSE	118.5	105.0	12.1	08890160
89349	89354	310	BAANTHR	101.0	113.5	11.7	08890160
89349	89354	313	BBFLANT	106.5	98.5	7.8	08890160
89349	89354	314	BKFLANT	80.0	78.0	2.5	08890160
89349	89354	315	BAPYRE	101.0	93.5	7.7	08890160
89349	89354	316	I123PYR	106.5	103.0	3.3	08890160
89349	89354	317	DBAHANT	95.0	96.0	1.0	08890154
89349	89354	318	B-GHI-PY	100.5	95.0	5.6	08890160
89349	89354	322	2MeNAPH		83.0	16.1	08890160
89349	89354	327	2FlBP-S	71.7	69.8	2.7	08890160
89349	89354	328	PTERP-S	79.0	81.0	2.5	08890160

Page 1

END OF REPORT

6.62

	W 3	P. 19.4	ENVIRONMENTAL	CHEHISTRY BRANCH	- DATA REPO	TING SHEET ( PA	AGE 1 OF 6 >	*******	22 JUN 01
	DESCRIPTION: GRE	EN BAY	MOBILE TRMT F	PLANT - OLIN-ESTES		NUMBER: 005490 SAMPLE: SEDIME		RECEIPT DATE: COMPLETION DATE:	25 10H 00
	COLUMN		1	2	3	4	5	6	
	ANALYTE.,			4	5	6	7	8	
	MG/KG	• • • • • • •	AS	CD	CR	CU	PB	HG	
SAMP #	DESCRIPTION								ROW
89371	BULK 1,2,3	EONC	2.60	0.770	43.7	43.8	58.5	1.07	, .
	<75UM A 6/2/00	%REC	91.4	79.4	95.8	92.4	104.2	116.0	[ 1
	1300 GB/BP CDF	DUPL	2.80	0.950	47.1	47.9	63.4	1.08	1
		DID	01260172	01260172	01260172	01260172	01260172	04650168	l s
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	04050100	r
89372	BULK 1,2,3	CONC	3.30	0.880	50.4	43.9	58.1	0.999	, ,
	<75UM B 6/2/00	%REC		į	i	1	1	1 5.777	[ 2
	1300 GB/BP CDF	DUPL		į	İ	i	i	i	1
		010	01260172	01260172	01260172	01260172	01260172	04650168	i
			_	HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	,	1
39373	BULK 1,2,3	CONC	3,60	1.06	51.0	67.4	74.1	1 4 40	1 =
	>75UM A 6/5/00	ZREC	• •	1	1	01.4	1 14.1	1.40	3
	1400 GB/BP CDF	DUPL		i	i	i	-	} 	1
		OID	01260172	01260172	01280172	01260172	01260172	04650168	
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	,020.03	1
374	BULK 1,2,3	CONC	3.50	1.16	50.3	78.0	1 79.5	1.48	1 .
	>75UM B 6/5/00	XREC		i		1	1 17.3	1 1.40	4
	1400 GB/BP CDF	DUPL		i	i	i	i		i
		DID	01260172	01260172	01260172	01260172	01260172	04650168	-
				HGA AUTH	NGA AUTH	HGA AUTH	HGÀ AUTH	1 1.220100	1
L#01	METHOD BLANK 01	CONC	<0.200	<0.020	<0.100	0.200	<0.100	<0.040	
		XREC		i.		1	.	[ 50.040	5
		DUPL		i	i	i	i	i	
		OID	01260172	01260172	01260172	01260172	01260172	04650168	i
				HGA AUTH	NGA AUTH	HGA AUTH	HGA AUTH		,
L#02	LCS 01	CONC	4.30	2.40	9.90	10.2	5.80	0.0768	1 6
		%REC	86.0	96.4	99.1	102.0	116.8	102.4	i
		DUPL		1		į,	i	i	1, %
		010	01260172	01260172 HGA AUTH	01260172 HGA AUTH	01260172 HGA AUTH	01260172 HGA AUTH	04650168	İ
							HIUA AUN		
S R	Arsenic Chromium					admium			
B	Lesd					opper			
	- 200				HG M	ercury			

	ESCRIPTION: GREE			HEMISTRY BRANCH -	امة	B NUMBE	R: 00549D-9231	0183 ŘE	CEIPT DATE:	
JHEM. PR	ESERVATIVE:			•	,	F SAMPL	E: SEDIMENT		ETION DATE:	25 JN
	COLUMN ANALYTE MG/XG		ż	2 4 CD	3 5 CR	•	-4 6 ¢∪	5 7 PB	6 8 RG	
SAMP #	DESCRIPTION									
BL#03	EXTERNAL QC 01	CONC	76.8	32.2	12.4	Ì	87.5	1150	0.050	1
		OID	01260172	   01260172   HGÁ AUTH	01260172 HGA: AUTH		01260172 HGA AUTH	   01260172   HGA AUTH	]   04650168	I
AS CR	Arsenic Chromium Lead				CD CU HG	Cadmiu Copper Mercur				
	Leau				ii u	Her Coi	<b>7.</b> .			
			•*							
					V.					
				;	<b>S</b> .					
-					·1·			1		
			•	•				•		
									ž.	•
									25	
					9°					

200000	DESCRIPTION: GRE RESERVATIVE:	EN BAY	MOBILE TRMT	PLANT - OLIM-ESTES		IUMBER: 00549D-9 SAMPLE: SEDIMENT		RECEIPT DATE: COMPLETION DATE:	55 70 02 10
	COLUMN		•	8	9	10	13	12	
	ANALYTE			10	11	13	25	30	
	MG/KG	•••••	NI	SE	AG	ZN	BA	FE	
SAMP #	DESCRIPTION								
89371	BULK 1,2,3	CONC	18.8	0.800	0.400	153	73.3	Lannas	
	<75UM A 6/2/00	%REC	96.2	83.6	82.6	99.8		13900	
	1300 GB/BP CDF		23.0	0.900	0.400	140	110.4	115.0	Ţ
		OID	01260172	01260172	-	:	79.2	14300	- 1
		4.5	HGA AUTH	01200172	01260172   HGA AUTH	01260173	01260172	01260173	1
89372	BULK 1,2,3	CONC	20.9	1.10	0.500	155	1.05.4	1	
	<75UM B 6/2/00	ZREC			1 0.200	[ 155 ·	82.6	17100	!
	1300 GB/BP COF	DUPL		i	i	i		!	
		OID	01260172	01260172	01260172	i   012401 <del>7</del> 2	1 013/0475		ļ
			HGA AUTH	, 0.200172	HTUA ADH	01260173	01260172	01260173	l
89373	BULK 1,2,3	conc		1.4.45					
בונקט			16.0	1.40	0.300	130	57.9	10900	
	>75UM A 6/5/00	XREC		ļ	I	1		İ	Ì
	1400 GB/8P CDF	DUPI.		Į.	1	1	1	İ	i
		010	01260172	01260172	01260172	01260173	01260172	01260173	i
			HGA AUTH		HGA AUTH		•	,	•
.9374	BULK 1,2,3	CONC	18.4	1.70	0.300	161	57.4	1 10600	ı
	>75UM B 6/5/00	XREC		i '	i	i		1 10000	1
	1400 G8/8P CDF	DUPL		- <b>i</b>	i	i	1	i i	!
		010	01260172	01260172	01260172	01260173	01260172	1 012/0177	ļ
			HGA AUTH	,	HGA AUTH	1 2.230113	1 01500172	01260173	1
BL#01	METHOD BLANK 01	CONC	<0.100	<0.200	<0.100	(1.00	1 -0 100	1 -2 -00	
		%REC	· - · - <del>-</del>	-	1 30,100	1 1.30	<0.100	. <2.00	!
		DUPL		. [	1	- }	ļ	ļ	!
		OID	01260172	01260172	1 1 01260172	1 01260173	1 01340477		ļ
			HGA AUTH	1 4:500115	HGA AUTH	1 01200173	01260172	01260173	ļ
BL#02	LCS 01	CONC	10.5	1.90		1 70 0	1.00		1
			105.0	74.4	2.40	20.0	24.7	55.0	- [
		DUPL		/#.# 	95.6	0.08	98.8	110.0	!
		OID	01260172 HGA AUTH	01260172	   01260172	01260173	01260172	01260173	1
			(********************************		HGA AUTH			•	
NI	Nickel				SE Sel	enium			
	Silver				ZN Zîr				
AG Ba	Barium				FE fro	ın.			

DATE: 22 JUN C. JOB FILE: 89371 JOB DESCRIPTION: GREEN BAY MOBILE TRMT PLANT - OLIN-ESTES JOB NUMBER: 005490-92310183 RECEIPT DATE: 05 JUN OL COMPLETION DATE: 22 JUN DO TYPE OF SAMPLE: SEDIMENT HEM. PRESERVATIVE: 10 25 30 13 11 10 ANALYTE..... 9 ZN AG MG/KG.....NI DESCRIPTION 13600 1.49 3.58 EXTERNAL OC 01 CONC 13.0 BL#03 **XREC** DUPL 01260173 01260172 01260173 01260172 010 01260172 01260172 HGA AUTH HGA AUTH Selenium SE NI Nickel Zinc ZN Silver AG Lron FE Barium

******	E: · 89371	*****	Chief Bouleage							DATE:	55 J	LN
•	•		ENATKONMENTA	L CHEMISTRY BRANCH -	DATA REPOR	TING SHEE	T ( PAGE 5 (	OF 6)	*****	*****	******	**
JOB	DESCRIPTION: GR	EEN BAY	MOBILE TRMY	PLANT - OLIN-ESTES	Inc	www.	005/CD 00740					
.KEM. P	RESERVATIVE:						005490-923101 SEDIMENT	63	RECEIPT COMPLETION	DATE:	05 Ji	UNI LINE
	COLUMN	· • • • • • •	13	14								
	ANALYTE.			33								
	₩G/KG		MN	МО								
SAMP #	DESCRIPTION											F
89371	BULK 1,2,3	CONC	418	0.200								,
	<75UH A 6/2/00	%REC	106.0	85.2	<b>!</b> I				•			
	1300 GB/BP CDF	DUPL		0.300	i							
		010	01260173	01260172								
			HGA AUTH	•	,							
89372	BULK 1,2,3	CONC	454	0.400								
	<75UM B 6/2/00	%REC		i į	ļ							
	1300 GB/BP CDF	DUPL	012/01	0.5/2/2-								
		010	01260173 HGA AUTH	01260172								
89373	BULK 1,2,3	CONC	758	[ 0.400								
	>75UM A 6/5/00	%REC		1								
	1400 GB/BP CDF	DUPL		iiii								
		010	01260173 HGA AUTH	01260172	•							
7374	BULK 1,2,3	CONC	906	0.400								
	>75UM 8 6/5/00	XREC		į								
	1400 GB/BP CDF	DUPL	01260173	013/0173				•				
		0.0	HGA AUTH	01260172				`\				
BL#01	METHOD BLANK OT	CONC	<0.100	[ <0.100								
		%REC										
		DUPL		j <sup>-</sup>					*			
		OID	01260173 HGA AUTH	01260172								
BL#02	LCS 01	CONC	9_90	4.50								
		%REC		90.0						,		
		DUPL		i i								٠ ١
			01260173 HGA AUTH	01260172								
ми	Manganese			P	10 Mo	l ybdenum				•		

JOB FILE: 89371 DATE: 22 JUN JOB DESCRIPTION: GREEN BAY MOBILE TRMT PLANT - OLIN-ESTES. JOB NUMBER: 005490-92310183 CHEM. PRESERVATIVE: RECEIPT DATE: 05 JUN 1 TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 22 JUN ( 14 ARALYTE..... 32 33 MG/KG..... MN MO DESCRIPTION RC EXTERNAL QC 01 CONC 452 **XREC** DUPL 010 01260173 01260172 HGA AUTH Molybdenum

JOB NUMBER: D05490-92310183 RECEIPT DATE: 05 JUN TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN 18 104 TRPH R. 140 B	CHEM. PRESERVATIVE:  TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN  COLUMN	JOB DESCRIPTION: GREEN BAY MOBILE TRMT PLANT - OLIN-ESTES' JOB NUMBER: C05490-92310183 RECEIPT DATE: 05 JUN CHEN. PRESERVATIVE:  COLUMN		SCRIPTION: GREE				DATA REPORTING SHEE	ET ( PAGE 1 OF 2	) ********	******
TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN  3 104 TRPH    140 B	CHEM. PRESERVATIVE:  TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN  CCLUMN	TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN  CCLUMN			N BAY MOBI	LE TRMT PLA			• .		
TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN  3 104 TRPH    140 B	CHEM. PRESERVATIVE:  TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN  CCLUMN	TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN  CCLUMN			N BAY MOBI	LE TRMT PLA					
3 104 TRPH    140 B	CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN    COLUMN	CREM. PRESERVATIVE:  COLUMN					NT - OLIN-ESIES	JOB NUMBER:	005490-92310183		
104 TRPH    140 B	### BESCRIPTION ####################################	### BESCRIPTION  ### BESCRIPTION  ### BULK 1,2,3						TYPE OF SAMPLE:	SEDIMENT	COMPLETION DATE:	15 JUN
TRPH    140 B	SAMP # DESCRIPTION	NR/KG		COLUMN	1		2	3	•		
140 B	SAMP # DESCRIPTION	### DESCRIPTION  ###################################									
140 B	89375 BULK 1,2,3 CONC 41600   240 B   140 B   1300 GB/BP CDF DUPL 1300 GB/BP CDF DUPL 1300 GB/BP CDF DUPL 1300 GB/BP CDF DUPL 1300 GB/BP CDF DUPL 1400 GB/BP CDF DUPL 1400 GB/BP CDF DUPL 1500 GB/BP CDF DUPL	### BULK 1,2,3 CONC 41600   240 8   140 8   140 8   1300 GB/BP CDF   DUPL   010 10040160   55990165   55990167		MG/KG	100	5	O&u	IKPA			
55990167	751M A 6/2/00 XREC DUPL   1300 GB/BP CDF DUPL   10040160   55990165   55990167	A   A   A   A   A   A   A   A	SAMP # I	DESCRIPTION							ŧ
55990167	75LM A 6/2/00 XREC DUPL   1300 GB/BP CDF DUPL   10040160   55990165   55990167	A   A   A   A   A   A   A   A	89375	RULK 1.2.3	CONC 416	500	240 B	140 B			
110 B	89376 BULK 1,2,3 CONC 41000   170 B   110 B   75590167    89377 BULK 1,2,3 CONC 51000   10040160	89376 BULK 1,2,3 CONC 41000   170 B   110 B   75 W					İ	į į			
110 B	89376 BULK 1,2,3 CONC 41000   170 B   110 B   751M B 6/2/00   28EC	89376 BULK 1,2,3 CONC 41000   170 B   110 B   750 M B 6/2/00 XREC	į	1300 GB/8P CDF		0/01/0	   EE000145	1 55000167			
630 B	A	A75LM B 6/2/00   XREC			100 סום	040100	כפו טצאכנ	10107566			
630 B	A	A75LM B 6/2/00   XREC	90374	DINY 1 2 7	CONC 410	000	l 170 B	i 110 B I			
630 B	B9377 BULK 1,2,3 CONC 34100   1080 B   630 B   755M A 6/5/00 78EC	B0377   BULK 1,2,3   CONC 34100   1080 B   630 B   755 M A 6/5/00   XREC						i i			
630 B	89377 BULK 1,2,3 CONC 34100   1080 B   630 B   75 LM A 6/5/00	89377 BULK 1,2,3 CONC 34100   1080 B   630 B   775UM A 6/5/00 XREC	,	1300 GB/BP CDF		0/0140	1 55000145	1 55000167			
	>75UM A 6/5/00	No.   No.			O10 100	040 t00	1 77770103	1 33770101		•	
	>75UM A 6/5/00 TREC	No.   No.	80777	R(II Y 1 2 3	בסאני אַע.	100	1 1080 B	1 630 B I			
420 B	BULK 1,2,3	BULK 1,2,3 CONC 43700   980 B   420 B   755M B 6/5/00   78EC   85.1   90.9   1400 GB/BP CDF   DUPL 38500   10040160   55990165   55990167   10040160   100						j i			
420 B	89378 BULK 1,2,3 CONC 43700   980 B   420 B   751M B 6/5/00	89378 BULK 1,2,3 CONC 43700   980 B   420 B   751M B 6/5/00 XREC   85.1   90.9   1400 GB/BP CDF   DUPL 38500   01D 10040160   55990165   55990167				0/0140	E500014E	1 55000167			
90.9	>75 UM B 6/5/00 XREC 85.1 90.9 1400 GB/BP CDF DUPL 38500 01D 10040160   55990165   55990167  BL#01 METHOD BLANK 01 CONC <100   66   80   XREC             01D 10040160   55990165   55990167  BL#02 LCS 01 CONC 10000   970   962   DUPL                     DUPL                             DUPL                                 DUPL	>75UM B 6/5/00			010 10	040 100	1 33770103	1 33770101			
90.9	>75 UM B 6/5/00 XREC 85.1 90.9 1400 GB/BP CDF DUPL 38500 01D 10040160   55990165   55990167  BL#01 METHOD BLANK 01 CONC <100   66   80   XREC             01D 10040160   55990165   55990167  BL#02 LCS 01 CONC 10000   970   962   XREC 100.0	>75UM B 6/5/00	80378	RULK 1.2 3	CONC 43	700	1 980 B	420 B	•		
	1400 GB/BP CDF DUPL 38500   55990165   55990167	1400 GB/BP CDF DUPL 38500   55990165   55990167   BL#01 METHOD BLANK 01 CONC 4100   66   80			<b>X</b> REC		•				
1 55990167	BL#01 METHOD SLANK 01 CONC <100   66   80	BL#01 METHOD BLANK 01 CONC <100   66   80		1400 GB/BP CDF			1 55000145				
1 221/2001	#REC DUPL 01D 10040160   55990165   55990167   8L#02 LCS 01 CONC 10000   970   962   #REC 100.0   DUPL   DUPL	**************************************			טוט וט	U-9 II I I I I	137770103	1 22770101			
80	#REC DUPL 01D 10040160   55990165   55990167   8L#02 LCS 01 CONC 10000   970   962   #REC 100.0   DUPL   DUPL	**************************************	gi #01	METHOD RIANY 01	CONC <1	00	1 66	80			
i į	01D 10040160   55990167   SEC 10000   970   962   SEC 100.0   DUPL   DUPL	01D 10040160   55990167   55990167   8L#02 LCS 01	DL#VI	FILLHOW SEARCH			i	i i			
	BL#02 LCS 01 CONC 10000   970   962   XREC 100.0	8L#02 LCS 01 CONC 10000   970   962   XREC 100.0				0/0146	EE000145	1 55000167			
1 33770101	TREC 100.0	XREC 100.0			U10 10	U4U16U	נפו הגאבנ 1	ן זסוטללכנ ן			
	XREC 100.0	XREC 100.0	bi #02	1 CS 01	CONC 10	חחת	I 970	1 962			•
1 962	DUPL	DUPL	81年02	FP9 OI			""				
962	01D 10040160   55990165   55990167	01D 10040160   55990165   55990167			DUPL			L FEOGRACIE			
					DID 10	1040160	55990165	35990167			
		Toc Motal Organic Carbon O&G Oil and Grease	TOC	Jotal Organia (	Carbon			O&G Oil and	Grease		
 	TOC Total Organic Carbon O&G Oil and Grease	ton total disante entent	TRPH	Total Recoverat		eum Kydroca	rbons	3.1.			
80		O'C Oil and Grease	8L#01 8L#02	1400 GB/BP CDF METHOD BLANK 01 LCS 01	DUPL 38 DID 10  CONC <1: XREC DUPL DID 10  CONC 10 XREC 10 DUPL DID 10	040160 00 040160 0000 00.0	55990165   66     55990165   970	55990167	Grease		
	XREC 100.0	XREC 100.0		LCS 01	CONC 10	1000	970	962			•
962	DID 10040160   55990165   55990167 [	DID 10040160   55990165   55990167 [				u.u	1				
962						040160	55990165	55990167			
 	Total Total organic corpora		TRPH	Total Recoverat	ble Petrol	eum Kydroca	rbons				

DATE: 15 JUN C JOB DESCRIPTION: GREEN BAY MOBILE TRMT PLANT - GLIN-ESTES JOB NUMBER: 005490-92310183 RECEIPT DATE: 05 JUN C TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 15 JUN C CHEM. PRESERVATIVE: COLUMN...... 1 3 160 104 MG/KG..... TOC D&G SAMP # DESCRIPTION RC EXTERNAL QC 01 CONC 21155 XREC DUPL 55990167 010 10040160 55990165 0&G TOC Total Organic Carbon Oil and Grease Total Recoverable Petroleum Hydrocarbons TRPH

Jobfile Number: 89375
Project: GREEN BAY MOBILE TRMT PLANT - OLIN-ESTES
Account Number: 00549D-92310183
Date Received: 05 JUN 00

Job#	Sample	Tst	Analyte	% REC	% SDUPL	RPD	OID
89375	89378 89378	100	O&G	85.1 90.9	78.8 89.0	7.7 2.1	55990165 55990167

Page 1

END OF REPORT

DATE: 16 JUN O

JOB	FILE:	89379
-----	-------	-------

	SERVATIVE:			LANT - OLIN-ESTES	TYPE OF SA	MPLE: SEDIMENT	MOD	PLETION DATE: 16	JUN
	COLUMN		1	.5	3	4	5	6	
	ANALYTE			138	139	140	141	142	
	UG/KG	•••••	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PC8-1254	
AMP #	DESCRIPTION								
9379	BULK 1,2,3 <75UM A 6/2/00 1300 GB/BP CDF	CONC XREC DUPL	<25.2	<25.2 	<25.2   	1095	<25.2 	<b>&lt;25.2</b> 	1
	1300 dayar coi		54830166	54830166	54830166	54830166	54830166	54830166	i
9380	BULK 1,2,3 <750M B 6/2/00	CONC XREC	<23.7	<23.7 	<23.7 	845	<23.7	<23.4   	
	1300 GB/BP CDF		54830166	54830166	54830166	54830166	54830166	54830166	j
	BULK 1,2,3 >75UM A 6/5/00	XREC	<29.5	<b>&lt;29.</b> 5	₹29.5	1662	<29.5	<29.5	
	1400 GB/BP CDF	DUPL OID	54830166	   54830166	54830166	54830166	54830166	54830166	
9382	BULK 1,2,3 >75UM B 6/5/00	XREC	<29.9	<29.9	<29.9 	1823 	<29.9	<29.9 	
	1400 G8/8P COF	DUPL	54830166	54830166	54830166	   54830166	54830166	54830166	1
L#01	METHOD BLANK 01	CONC XREC DUPL	<8.33	<8.33 	<8.33	( <8.33	<8.33	<8.33 	
		OID	54830166	54830166	54830166	54830166	54830166	54830166	İ
1,#02	LCS 01		0.82 98.4	į n/a.	N/A	∏ N/A	N/A	N/A	1
	•	DUPL	54830166	54830166	54830166	54830166	54830166	54830166	

DATE: 16 JUN C E JOB FILE: 89379 JOB NUMBER: 005490-92310183 RECEIPT DATE: , 05 JUN C JOB DESCRIPTION: GREEN BAY MOBILE TRMT PLANT - OLIN-ESTES TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 16 JUN C CHEM. PRESERVATIVE: COLUMN..... 7 9 ANALYTE..... 343 145 146 UG/KG..... PCB-1260 TCLXYL-S DCLBP SAMP # DESCRIPTION RC BULK 1,2,3 CONC 42.8 82.3% 79.2% <75UM A 6/2/00 %REC 1300 GB/BP CDF DUPL 54830166 OID 54830161 54830166 82.1% 89380 BULK 1,2,3 CONC 37.1 89.1% <75UM B 6/2/00 XREC 1300 GB/BP CDF CUPL DID 54830161 54830166 54830166 81.7% 1 75.8% CONC 74.3 89381 BULK 1,2,3 >75UM A 6/5/00 XREC 1400 GB/BP CDF DUPL 54830166 54830166 DID 54830161 74.1% 89382 BULK 1,2,3 CONC 81.5 86.2% >75UM B 6/5/00 %REC 1400 GB/BP CDF DUPL 54830166 010 54830161 54830166 BL#01 METHOD BLANK 01 CONC <8.33 81.1% XREC DUPL 010 54830161 54830166 54830166 77.4% 78.6% BL#02 LCS 01 CONC 0.87 %REC 104.4 DUPL 54830166 QID 54830161 54830166 TctXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS PCB-1260 PCB-1260 Decachlorobiphenyl(Surrogate (60-150 WS))

	on: Green Bay Mobile Trimt Plant - Olin-Es  ECB Quality Assurance		n Form
	•		
Analysis:	PC8	Date:	15-June-00
Analyst:	A. Morrow	Instrument:	5890 #83 GC
Problem:	There is PCB's present, not sure if it is	1242 or 1248	-
Sample Nui	mber(s) Affected: 89379-89382	4	
		•	
Recommen	ded Corrective Action: Report as 1242	and do further study.	
1	·		4.
	;		÷.
Corrective A	Action Taken By Analyst: Same as above		
	·		
Comments:	There will be further clean-up and analy qualitatively identify sample contaminar		titate and
	quantatively identity sample contaminar	KS.	
	tive Action Taken: 15-June 00	0.0	
Reviewed b	y James Hoch	irlan	
			c:\caf\caffor

	DESCRIPTION: GR	EEN BAY	MOBILE TRMT	PLANT - OLIN-ESTES		NUMBER: 005490-9. SAMPLE: SEDIMENT		RECEIPT DATE: 05
	COLUMN		1	2	3	4	5	6
	ANALYTE. UG/KG			294 ACENAY	296 Acenap	297 FLUORE	303 PHENAN	304 Antrac
SAMP #	DESCRIPTION							
89383	BULK 1,2,3 <75UM A 6/2/00 1300 GB/BP CDF	CONC %REC DUPL	72.9	<20 	10 J 	26.0 	166	27.0
		010	08890160	08890160	08890160	08890160	08890160	i   08890160
89384	BULK 1,2,3 <75UM B 6/2/00 1300 GB/BP CDF	CONC XREC DUPL	99.0	<19 	12 J	29.5	186	31,4
	,505 83,61 001	OID	08890160	08890160	08890160	08890160	08890160	08890160
89385	BULK 1,2,3 >75UM A 6/5/00 1400 GB/BP CDF	CONC XREC DUPL	352	43.2 	60.7	118 	886	202 
		010	08890160	08890160	08890160	08890160	08890160	   08890160
89386	BULK 1,2,3 >75UM B 6/5/00	CONC	382	] 39.2 ]	63.0 	128 	868	185 
	1400 GB/BP CDF	DUPL OID	08890160	08890160	   08890160	08890160	08890160	08890160
BL#01	METHOD BLANK 01	CONC XREC DUPL	<10	<10 	<10 	<10 	<10 	<10
			08890160	08890160	08890160	08890160	08890160	08890160
BL#02	LCS 01	CONC		64.0	76.0	80.5	88.5	85.5
		XREC DUPL		64.0	76.0	80.5	88.5	85.5
		OID	08890160	08890160	08890160	08890160	08890160	08890160
NAPHTH ACENAP PKENAN	Naphthalene Acenaphthene Phenanthrene				FLUORE FLU	enaphthylena Jorene Chracene		
	-							
.•								

JOB CHEM. F	DESCRIPTION: GRE PRESERVATIVE:	EN BAY	MOBILE TRMT	PLANT - OLIN-ESTES		NUMBER: 0054 SAMPLE: SEDI	Sir vit	22.12.	05 · 19
	COLUMN		7	8	9	10	11	12	
	ANALYTE.			307	309	310	313	314	
	UG/KG		FLANTHE	PYRENE	CHRYSE	BAANTHE	BBFLANT	BKFLANT	
SAMP #	DESCRIPTION								
89383	BULK 1,2,3	CONC	248	222	[ 141 ·	90.9	105	1 68.9	
	<75UM A 6/2/00	XREC		i	<b>.</b>	1 20.7	103	03.9	
	1300 GB/BP CDF	DUPL		İ	i ·	i	i	. I.	
		OID	08890160	08890160	08890160	0889016	08890160	08890160	
89384	BULK 1,2,3	CONC	273	1 258	163	1 105	Laša:	11. augustus	٠.
	<75UM B 6/2/00	%REC		1 20	1 103	1 105	120	83.8	
	1300 GB/BP CDF	DUPL		i	i	l. I	l l	ļ	
		OID	08890160	08890160	08890160	0889016	0 08890160	08890160	
89385	BULK 1,2,3	CONC	1200	J 1420	1 875	Laka	t in	 3	٠
	>75UM A 6/5/00	%REC	1200	1420	0/3	812	584	473	
	1400 GB/BP CDF	DUPL		i .	[ 			·	
		OID	08890160	08890160	08890160	0889016	08890160	08890160	,
89386	BULK 1,2,3	CONC	1060	.] 1300	l 825 -	700	Leu		
	>75UM B 6/5/00	XREC.		1	! "	1.700	546	454	. !
	1400 GB/BP CDF	DUPL.		j	i	i	1 3	1	
		010	08890160	08890160	08890160	08890160	08890160	08890160	Ì
BL#01	METHOD BLANK 01	CONC	<10·	<10	I <10	l <10	<10	L ado	
		XREC		i	i <sup>77</sup>	1 -10	1 10	<10	- 1
		DUPL		ĺ	i	í	· •	! '	4
		OID	08890160	08890160	08890160	08890160	08890160	08890160	j
IL#02	LCS 01	CONC	91.5	87.0	97.5	1 85.0	78.5	1.88.0	
		XREC	91.5	87.0	97.5	85.0	78.5   78.5	88.0	- [
		DUPL		1	,		1 .5.2	1	1
		ÖID	08890160	08890160	08890160	08890160	08890160	08890160	į
LANTHE	Fluoranthene				PYRENE Pyr	ene			
HRYSE	Chrysene				•	izo(a)Anthrac			

JOB CHEM.	DESCRIPTION: GR PRESERVATIVE:	EEN BAY	MOBILE TRMT	PLANT - OLIN-ES		NUMBER: 00549D-9 SAMPLE: SEDIMENT		RECEIPT DATE: COMPLETION DATE:
	COLUMN ANALYTE. UG/KG	· · · · · · ·	315	14 316 I 123PYR	15 317 DBAHANT	16 318 B-GHI-PY	17 322 2MeNAPH	18 327 2flbp-s
SAMP #	DESCRIPTION							<b>_</b>
89383	BULK 1,2,3 <75UM A 6/2/00 1300 GB/BP CDF	CONC %REC DUPL OID	99.9 08890160	90.9	19 J	103	86.9	65.2%
		0.0	V007C100	∫ <b>0889</b> 0160	08890160	08890160	08890160	08890160
89384	BULK 1,2,3 <75UM B 6/2/00 1300 GB/BP CDF	CONC %REC DUPL	117	108 	20.0 	122	111	75.9% 
		OID	08890160	08890160	08890160	08890160	08890160	08890160
89385	BULK 1,2,3 >75UM A 6/5/00 1400 GB/BP CDF	CONC %REC DUPL	813	553 	114 	611	411 	75.9%
		010	08890160	08890160	08890160	   08890160	   08890160	08890160
89386	BULK 1,2,3 >75UM B 6/5/00 1400 GB/BP CDF	CONC %REC DUPL	725	527	1114	617	441	74.3x
	,	010	08890160	08890160	08890160	08890160	08890160	   08890160
BL#01	METHOD BLANK 01	CONC XREC DUPL	<10	<10 	<10 	<10 	<10 	82.6%
			08890160	08890160	08890160	0889,0160	08890160	08890160
BL#02	LCS 01	CONC %REC DUPL		87.0 87.0	85.5 85.5	91.0   91.0	65.5	73.7% 73.7
			08890160	08890160	08890160	08890160	08890160	08890160
BAPYRE DBAHANT ZMeNAPH	Benzo(a)Pyrene Dibenzo(A,H)Antl 2-Methylnaphtha				B-GHI-PY Ben:	eno(1,2,3-C,D)Pyr zo(G,H,L)Perylene Luorabiphenyl(Sur		\$))

```
. JOB FILE: 89383
                                                                                                             DATE: 14 JUR
  ********************************** ENVIRONMENTAL CHEMISTRY BRANCH - DATA REPORTING SHEET ( PAGE 4 OF
    JOB DESCRIPTION: GREEN BAY MOBILE TRMT PLANT - OLIN-ESTES
                                                                                                      RECEIPT DATE: 05 JUL
                                                                   JOB NUMBER: 005490-92310183
  CHEM. PRESERVATIVE:
                                                                                                   COMPLETION DATE: 19 JUN
                                                               TYPE OF SAMPLE: SEDIMENT
                COLUMN...... 19
               ANALYTE..... 328
               UG/KG..... PTERP-S
  SAMP #
        DESCRIPTION
 89383
          BULK 1,2,3
                          CONC 79.6%
          <75UM A 6/2/00 XREC
          1300 GB/BP COF DUPL
                          OID
                               08890160
 89384
          BULK 1,2,3
                          CONC 78.4%
                         ZREC
          <75UM B 6/2/00
          1300 GB/BP CDF
                         DUPL
                         O1D 08890160
 89385
         BULK 1,2,3
                         CONC 86.0%
          >75UM A 6/5/00
                         XREC
          1400 GB/BP CDF
                         DUPL
                         DID
                               08890160
 89386
         BULK 1,2,3
                         CONC 86.9%
         >75UH B 6/5/00
                         XREC
          1400 GB/BP CDF
                         DUPL
                         OID 08890160
         METHOD BLANK 01 CONC 76.6%
 BL#01
                         XREC
                         DUPL
                         010 08890160
 BL#02
         LCS 01
                         CONC 70.8%
                         %REC 70.8
                         OUPL.
                         OID
                              08890160
 PTERP-S p-Terphenyl-D14(Surrogate (18-137 S))
```

DJOB FI E: 89525 DATE: 03 AUG C JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLT - OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 26 JUN 0 CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 3 AUG O COLUMN...... 1 2 3 6 ANALYTE..... 2 4 5 6 7. 8 MG/XG..... AS CR CU HG SAMP # DESCRIPTION RON 89585 C4B BULKA CONC 2.10 0.609 28.9 27.3 42.9 1.08 6/21/00 1100 %REC 94.6 92.4 87.8 80.8 98.0 112.3 GB NW DMP CELL4 DUPL 2.20 0.609 28.8 27.4 42.4 1.07 DID 01260215 01260215 01260215 01260215 01230209 04650189 HGA AUTH HGA AUTH HGA AUTH HGA AUTH 89586 C48 BULKE CONC 2.30 0.600 30.7 38.3 44.5 1.09 6/21/00 1100 2 XREC BG NW DMP CELL4 DUPL 010 01260215 01260215 01260215 01260215 01230209 04650189 HGA AUTH HGA AUTH HGA AUTH HGA AUTH BL#01 METHOD BLANK 01 CONC: <0.200 <0.020 <0.100 0.600 | <1.00 <0.040 3 %REC DUPL 010 01260215 01260215 01260215 01260215 01230209 04650189 HGA AUTH HGA AUTH HGA AUTH HGA AUTH 8L#02 LCS 03 CONC 9.40 4.84 19.0 17.4 1 21.0 0.077 4 XREC 93.7 96.8 95.0. · 87.0 105.0 1 102.1 DUPL 01260215 OID 01260215 01260215 01260215 01230209 04650189 HGA AUTH HGA AUTH HGA AUTH HGA AUTH BL#03 EXTERNAL QC 01 CONC 88.3 1 37.1 22.5 86.9 1 1140 0.058 5 **XREC** DUPL OID 01260215 01260215 01260215 01260215 01230209 04650189 HGA AUTH HGA AUTH **HGA AUTH** HGA AUTH · 4 AS Arsenic Cadmium CR Chromium CU Copper PB Lead HG Mercury

JOB DESCRIPTION: GREEN BAY HOSTLE TRINT PLT - OLIN-ESTES TIPE OF SAMPLE: STDIMENT COLUMN	· ·		۔ . نادہ ا		N.T 0119-ESTES	100	NINDER - NOSAPO-	0210183	RECEIPT DATE:	ni AC
AMALYTE		the state of the s	N BAY I	CBILE TRIMI	PET - OCTA-ESTES					
SAMP # DESCRIPTION  89585		ANALYTE		ģ	10	11	. 13	25	30	
B9585   CAB BULKA   CONC   10.3   0.499   0.299   74.0   40.5   7550   6/21/00   1100   XREC   96.4   106.6   17.6   90.8   96.6   160.0   160.0   10.1   0.499   0.399   74.5   40.5   75.6   160.0   1230209   01230209	SAMP #			111	<b>.</b>					
A						ممد ما	1.77.0	T and e	d wine	
### HGA AUTH ### AUTH	<b>8</b> 9585	6/21/00 1100	%REC	96.4 10.1	106.6 0.499	17.6	90.8 74.5	96.6 40.5	160.0   7540	1
BL#01 NETHOD BLANK 01 CONC. 1.20   <0.200   <0.100   <1.00   <0.100   <2.00   <0.200   <0.100   <1.00   <2.00   <0.100   <2.00   <0.100   <0.100   <0.100   <2.00   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100			OID		01260215		01230209	1 0352050A	01230209	
DID   01230209   01260215   01260215   01230209   012	89586	6/21/00 1100	%REC	11.3	0.500	0.700	78.2	45.2	94.8	}     
Name		BG NW DMP CELL4			01260215	4	01230209	01230209	01230209	i
BL#02   LCS 01   CONC 21.6   4.10   4.50   49.9   51.0   110	BL#01	METHOD BLANK 01	%REC	1.20	<0.200	•	<1.00 	<0.100 	<2.00	Ĩ
XREC   108.0   82.8   90.8   99.8   102.0   110.0	:				01260215		01230209	01230209	01230209	)
DUPL   O1230209   01260215   01260215   01230209   01		LCS 01	XREC		•		7	102.0	•	
BL#03 EXTERNAL QC 01 CONC 16.6   1.69   4.49   282   195   24900					01260215	•	01230209	01230209	01230209	i
OID 01230209   01260215   01230209   0123020	BL#03	EXTERNAL QC 01	%REC	16.6	1.69 	4.49	282		[ '24900'- ]	. 1
AG Silver ZN Zinc BA Barium FE Iron					01260215	•	01230209	01230209	01230209	
BA Barium FE Iron	N3	Nickel								
		and the second s						•		

JOS FAL	8958 <sup>5</sup>						DATE:	03 AL
******	*********	**** E	INVIRONMENTAL	CHEMISTRY BRANCH	- DATA REPORTING SI	HEET ( PAGE 3 OF	3 ) **********	****
	DESCRIPTION: GREE SESERVATIVE:	N BAY	MOBILE TRIMT	PLT - OLIX-ESTES	JOB NUMBER	R: 0054PD-92310183 E: SEDIMENT	RECEIPT DATE: COMPLETION DATE:	26 JL 3 AL
	COLUMN ANALYTE MG/KG		32	14 33 Ma				
SAMP #	DESCRIPTION	•••••	MN	riu				
89585	C4B BULKA 6/21/00 1100 GB NW DMP CELL4		101.6	0.299   105.4   0.299				
		OID	01230209 HGA AUTH	01260215	1			
89586	C48 BULKB 6/21/00 1100 BG NW DMP CELL4	CONC %REC DUPL	146	<b>6.</b> 400				
		010	01230209 HGA AUTH	01260215	1			
BL#01	METHOD BLANK 01	CONC %REC DUPL	<0.100	<0.100 	 			
		OID	01230209 HGA AUTH	01260215	1			
BL#02	LCS 01		19.6 98.0	5.00 100.0				
		OID	01230209 HGA AUTH	01260215	1			
BL#03	EXTERNAL QC 01	CONC XREC DUPL	492	0. <del>9</del> 97   				
		OID	01230209 HGA AUTH	01260215	Ì			
WN	Manganese				MO Holybd	ienum		

	DESCRIPTION: GREE RESERVATIVE:	N'BAY	MOBILE TRIMT	PLT - ÖLIN-ESTÉS		MBER: 0054PD-92 MPLE: SEDIMENT		RECEIPT DATE: COMPLETION DATE:	26 JUN 13 JUL
	COLUMN ANALYTE UG/KG	-,	137	2 138 PCB-1221	3 139 PCB - 1232	4 140 PCB-1242	5 141 PCB-1248	6 142 PCB-1254	
SAMP #	DESCRIPTION								R
89587	C4B BULK1 6/21/00 1100 BG NU DMP CELL4	%REC	<12.7	<12.7 	<12.7 	<12.7	3787	<12.7 <sup>-</sup>	ľ
		OID	54830182	54830182	54830182	54830182	54830182	54830182	 
39588	C48 BULKB 6/21/00 1100 GB NW DMP CELL4	CONC XREC DUPL	<12.7	<12.7 	] <12.7   	<12.7 	3722 	1<12.7	1
		010	54830182	54830182	54830182	54830182	54830182	54830182	ļ
3L#01	METHOD BLANK 01	CONC ZREC DUPL	<8.3	<8.3	<8.3   _3 	<8.3 	<8.3	<8.3 	
		OID	54830182	54830182	54830182	54830182	54830182	54830182	•
3L#02	LCS 01	CONC %REC DUPL	0.97 116.0	l N/A	N/A 	l N/A	N/A	l N/A	
		OID	54830182	54830182	54830182	54830182	54830182	54830182	1

JOB FILE: 85587 DATE: 13 JUL JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLT - OLIN-ESTES-JOS NUMBER: 0054PD-92310183 RECEIRT DATE: 26 JUN CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 13 JUL COLUMN..... 7 ANALYTE..... 143 145 146 UG/KG..... PCB-1260 TclXYL-S DCLBP SAMP # DESCRIPTION 89587 C4B BULX1 CONC 41.9 98.4% 82.3% 6/21/00 1100 %REC BG NW DMP CELL4 DUPL 010 54830182 54830182 54830182 89588 C4B BULKB CONC 36.1 91.2% 84.1% 6/21/00 1100 %REC GB NW DMP CELL4 DUPL OID 54830182 54830182 54830182 BL#01 METHOD BLANK 01 CONC <8.3 89.5% 90.9% **XREC** DUPL 010 54830182 54830182 54830182 BL#02 LCS 01 CONC 1.03 96.7% 95.6% %REC 124.0 DUPL 010 54830182 54830182 54830182 PCB-1260 PCB-1260 TclXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS Decachtorobiphenyl(Surrogate (60-150 WS)) DCLBP + 1%

DATE: 11 JL

	DESCRIPTION: GREENESERVATIVE:	EN BAY	HOBILE TRIMT	PLT - OLIN-ESTES			0054PD-92310183 SEDIMENT	RECEIPT DATE: COMPLETION DATE:	26 ມູນ 11 ມູນ
	COLUMN		1	2.	3 '	.4			
	ANALYTE	• • • • • •	86	95	100	1:	04		
	MG/KG	• • • • • •	TOC	TVS	O&G	.71	RPH		
SAMP #	DESCRIPTION								
39589	C48 BULK A	CONC	26100	1 <4	230	1 1	9ù i		
	6/21/00 1100	2REC		i	i	1	1		
	GB NW DMP CELL4	DUPL	25700	i i	i	i	i i		
		010	60040187	10150154	55990189	5!	5990191		
39590	C4B BUKK B	CONC	28500	<4	] 210	I 18	80 [		
	6/21/00 1100	XREC	, ,	i	88.9		8.2		
	GB NW DMP CELL4	DUPL		i	i	i			
	•	OID	60040187	10150154	55990189	55	5990191		
	11.20.1812.2	2	5.0	q					
L#01	METHOD BLANK 01		<100	<4	<b>&lt;</b> 35	8	J [		
		%REC				£	1		
		DUPL			!	į	[1]		
		OID.	60040187	10150154	55990189	55	5990191		
L#02	LCS 01	CONC	8640	l nza	932	1 94			
		ZREC	94.6	1 7/0	91.7	•	5.3		
		DUPL		1	1	1 7-			
		010	60040187	10150154	55990189	55	5990191		
							,		
L#03	EXTERNAL QC Q1	CONC	20700	l N/A	N/A	.1.87	/a l		
		<b>XREC</b>		i	i	1 7	· ·		
		DUPL		i	i	i	<u> </u>		
		010	60040187	10150154	55990189	55	990191		
									j
OC.	Total Organic C	arbon					atile Solids		.*
&G	Oil and Grease				TRPH	Total Rec	overable Petroleum i	ivdrocarbone	

Jobfile Number: 89589
Project: GREEN BAY MOBILE TRIMT PLT - OLIN-ESTES
Account Number: 0054PD-92310183.
Date Received: 26 JUN 00

Job#	Sample	Tst	Analyte	% REC	% SDUPL	RPD	OID
89589 89589	89590 89590 BL#02 BL#02	104 100	O&G TRPH O&G TRPH	88.9 88.2 91.7 93.3	87.7 86.9 91.2 93.0	1.4 1.5 0.5 0.3	55990189 55990191 55990189 55990191

Page 1

END OF REPORT

1/0/13 1/10/13 1/193 FILL: 89591

DATE: 10 JUL

	COLUMN		1	ż	3	4	5	···6	
	ANALYTE		290	294	3 296	297	303	304	
	UG/KG			ACENAY	ACENAP	FLUORE	КАКЭН	ANTRAC	
AMP.#	DESCRIPTION								
9591	C4B' BÜLK A	CONC	.121	1141	34.2	49.8	219	.43-8	Ŧ
	6/21/00 1100	XREC		1	1		1	1	i
	GB NU DMP CELL4	DUPL		1	1	1	ľ	İ	j
		ĠĮĎ	08890181	08890181	08890181	08890181	08890181	08890181	1
9592	C48 BULK B	CONC	126	17.3	1 48.3	1 57.0	238	49.3	1
	6/21/00 1100	XREC	40.0	58.5	62.5	77.5	1	87.5	1
	GB NW DMP CELL4	DUPL	17.	1			<u>†</u>	1 5.122	-
		010	08890181	08890181	08890181	08890181	08890181	08890181	İ
L#01	METHOD BLANK 01	CONC	<3.3	1 3.3	1 3.3	1 <3.3	1 <3.3	<3.3	,
	The second of th	%REC DUPL	3 <b>5 4</b> 5			1	1	1	
	,	OID	08890181	08890181	08890181	08890181	08890181	08890181	Ì
L#02	LCS_01	CONC	40.0	43.7	1 49.0	1 52.0	53.7	54.7	1
		XREC	60.0	65.5	73.5	78.0	80.5	82.0	- 1
		DUPL		1	1		1	1	- 1
		OID	08890181	08890181	08890181	08890181	08890181	08890181	i

\*\*\*\*\*\*\*\* ENVIRONMENTAL CHEMISTRY BRANCH - DATA REPORTING SHEET ( PAGE 1 OF

JOB FI	LE: 89591							DATE:
*****	****	***** }	ENVERONMENTA	L CHEMISTRY BRANC	H - DATA REPORTIS	NG SHEET ( PAGE	2 OF 4 ) ***	*******
	DESCRIPTION: GRE	EN BAY	MOSILE TRIM	IT PLT - OLIN-ESTE		UMBER: 0054PD-9 AMPLE: SEDIMENT		RECEIPT DATE:
	COLUMN ANALYTE UG/KG		306	8 307 PYRENE	9 309 CHRYSE	10 310 Baanthr	11 313 88FLANT	12 314 BKFLANT
SAMP #	DESCRIPTION							
89591	C4B BULK A 6/21/00 1100 GB NW DMP CELL4	CONC XREC DUPL	203	248	133	110 	72.5	69.5
		OID	08890181	08890181	08890181	08890181	08890181	08890181
89592	C4B BULK B 6/21/00 1100 GB NW DMP CELL4	CONC XREC DUPL	231	278   	163   73.5	140   85.0	97.7   81.5	77.3   55.5
		010	08890181	08890181	08890181	08890181	C8890181	08890181
BL#Ó1	METHOD BLANK 01	CONC XREC DUPL	<3.3	<3.3 	<3.3	<3.3 	<3.3	<3.3
		010	08890181	08890181	08890181	08890181	08890181	08890181
BL#02	LCS 01	CONC %REC DUPL		54.7   82.0	65.0   97.5	60.7   91.0	52.7   79.0	61.0
		010	08890181	08890181	08890181	08890181	08890181	08890181
FLANTHE CHRYSE BBFLANT	Chrysene	nthene				ene zo(a)Anthracene zo(k)Fluoranthen	e	

******	E: 89591	Laz.a						DATE:	10 រប
		****	ENVIRONMENTAL	CHEMISTRY BRANI	CH - DATA REPO	ORTING SHEET ( PAGE	3 OF 4 3 **	*****	****
ĴŒ	DESCRIPTION: GRE	EU DAV	HODEL C YDDAY	DIT 01711 Fina				•	
CHEM. P	RESERVATIVE:		TOUTE INTH	PLI - OLIN-ESII		OB NUMBER: 0054PD-9 OF SAMPLE: SEDIMENT		RECEIPT DATE:	10 JUL
	COLUMN			14	15	16	17	18	
	ANALYTE			316 [123PYR	317 DBAHANT	318 B-GHI-PY	322	327	
~~··~ #				TIEST IK	yoknan).	B-GHI-PT	2McNAPH	2F(BP-S	
SAMP #	DESCRIPTION								
89591	C4B BULK A	CONC	102	75.0	12.6	87.1	145	68.4%	,
	6/21/00 1100 GB NW DMP CELL4	ZREC DUPL			-	ļ	1	r	ŧ
		OID	08890181	08890181	08890181	   08890181	I ] 08890181	08890181	
									۴.
89592	C4B BULK 8 6/21/00 1100	CONC	133 62.0	89.0	18.3	j 104	146	67.0%	1
	G8 NW DMP CELL4	DUPL.	62.0	79.5	87.5 	76.0	0.83	65.1	j
		OID	08890181	08890181	08890181	08890181	08890181	08890181	.I 
	Tullate to the								
BL#01	METHOD BLANK 01	CONC	<b>×3.3</b>	∢3.3	<3.3	<3.3	<3.3	78.1%	1
		DUPL			1	, I , I		Ì	ļ
		010	08890181	08890181	08890181	08890181	08890181	08890181	
BL#02	LCS 01	CONC	51.3	54.3	57.7	1 20 ~	ř		
		XREC		81.5	86.5	65.7	42.7   64.0	70.6%	į
		DUPL OID	08890181	08890181	08890181	   08890181	08890181		
	•			, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		į 00090 tat	1 00890181	08890181	١.
BAPYRE	Benzo(a)Pyrene				1123PYR	Indeno(1,2,3-0,0)Py	rene		
DBAHANT 2Menaph	Dibenzo(A,K)Anti 2-Methylnaphtha		e		B-GHI-PY 2FlBP-S	Benzo(G, H, I)Peryter	e		
					21187-2	2-Fluorobiphenyl(Su	rrogate (30-115	S)):	
									+ 1°
							•		
							•		
									.4.

DATE: 10 JUL , JOS FILE. 89591 RECEIPT DATE: 26 JUN : JOS NUMBER: 0054PD-92310183 JOB DESCRIPTION: GREEN BAY MOBILE TRIMT PLT - OLIN-ESTES COMPLETION DATE: 10 JUL : TYPE OF SAMPLE: SEDIMENT CHEM. PRESERVATIVE: COLUMN...... 19 ANALYTE..... 328 UG/KG..... PTERP-S RC SAMP # DESCRIPTION 89591 C48 BULK A CONC 73.9% 6/21/00 1100 %REC GB NW DMP CELL4 DUPL 010 08890181 89592 C4B BULK B CONC 77.0% 6/21/00 1100 XREC 79.5 GB NW DMP CELL4 DUPL otb 08890181 METHOD BLANK 01 CONC 80.2% BL#01 %REC DUPL 010 08890181 CONC 70.5% LCS 01 BL#02 ZREC DUPL OID 08890181 PTERP-S p-Terphenyl-D14(Surrogate (18-137 S)) . 1

Jobfile Number: 89591
Project: GREEN BAY MOBILE TRTMT PLT - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 26 JUN 00

Job#	Sample	Tst	Analyte	% REC	% SDUPL	RPD	OID
89591	89592	290	NAPHTH	40.0	51.5	25.1	08890181
89591	89592	294	ACENAY	58.5	58.5	0.0	08890181
89591	89592	296	ACENAP	62.5	60.5	3.3	08890181
89591	89592	297	FLUORE	77.5	75.5	2.6	08890181
89591	89592	304	ANTRAC	87.5	84.0	4.1	08890181
89591	89592	309	CHRYSE	73.5	77.0	4.7	08890181
89591	89592	310	BAANTHR	85.0	94.5	10.6	08890181
89591	89592	313	BBFLANT	81.5	75.5	7.6	08890181
89591	89592	314	BKFLANT	55.5	60.0	7.8	08890181
89591	89592	315	BAPYRE	62.0	67.0	7.8	08890181
89591	89592	316	I123PYR	79.5	79.5	:0.0	08890181
89591	89592	317	DBAHANT	87.5	8750.0	196.0	08890181
89591		318	B-GHI-PY	76.0	75.0	1.3	08890181
89591	89592	322	2MeNAPH	68.0	65.5	3.7	08890181
89591	89592	327	2F1BP-S	65.1	65.0	0.2	08890181
89591	89592	328	PTERP-S	79.5	81.1	2.0	08890181

Page 1

END OF REPORT

÷ 1/2

4/03/03, TLE: 89723

	DESCRIPTION: GREENESERVATIVE:	EN BAY	MOBILE TRNT	PLANT - OLIN-ESTES	JOB N TYPE OF S	UMBER: 0054PD-9 AMPLE: SEDIMENT		RECEIPT DATE: COMPLETION DATE:	03 JUL 3 AUG
	COLUMN		1	2	3	4	5	6	
	ANALYTE		<del>-</del>	4	5	6	7	8	
	MG/KG	• • • • • •	AS	CD	CR	cu	P8	HG	
AMP #	DESCRIPTION								
9723	BULK 1,2,3 >2.0	CONC	1.80	0.669	41.3	27.3	40.9	0.625	1
		XR EC	95.4	91.4	81.2	76.8	99.2	1 105.2	1
		DUPL	1.80	0.699	43.5	29.0	41.9	0.631	- 1
		010	01260215	01260215	01260215	01260215	01230209	04650199	;
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	(	,
9724	BULK 1,2,3 <2.0		2.99	1.94	85_2	97.2	51.0	2.20	ļ
		XREC		ļ		ļ	1	1	}
		DUPL	04040045				ļ		- 1
		OID	01260215	01260215	01260215	01260215	01230209	04650199	- 1
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
L#01	METHOD BLANK 01	CONC	<0.200	<0.020	j <0.100	0.600	<1.00	<0.040	i
		%REC		1	'	i	Ì	i	i
		DUPL		ļ	1	1	1	i	i
		010	01260215	01260215	01260215	01260215	01230209	04650199	İ
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		,
L#02	LCS 01	CONC	9.40	1 4.80	19.0	17.4	21.0	1 0.0752	
		XREC	93.7	96.8	95.0	. 87.0	105.0	100.3	;
		DUPL		İ	i i	i	$-1\sqrt{\chi}$	1	i
		OID	01260215	01260215	01260215	01260215	01230209	04650199	i
				HGA AUTH	HGA . AUTH	HGA AUTH	HGA AUTH	1	'
.#03	EXTERNAL QC 01		88.3	37.1	22.5	86.9	1140	0.053	1
		XREC			İ	Ì	İ	į	i
		DUPL		1	Ī	1	ĺ	į	i
		OID	01260215	01260215	01260215	01260215	01230209	04650199	i
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	•	•

JOB FILE: 89723 DATE: 03 AUG C JOB DESCRIPTION: GREEN BAY MOBILE TRNT PLANT - OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 03 JUL C CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 3 AUG 0 COLUMN...... 7. 10 11 12 ANALYTE..... 9 10 11 13 25 30 MG/KG......NI SE AG ZN 8A FE SAMP # DESCRIPTION RC 89723 BULK 1,2,3 >2.0 CONC 17.2 0.599 0.400 91.5 70.7 14600 %REC 96.2 84.8 94.4 89.2 97.8 230.0 DUPL 17.5 0.599 0.400 91.3 71.8 14800 OID 01230209 01260215 01260215 01230209 01230209 01230209 HGA AUTH HGA AUTH 89724 BULK 1,2,3 <2.0 CONC 17.4 0.998 0.599 128 73.5 7850 %REC DUPL 01230209 OID 01260215 01230209 01260215 01230209 01230209 HGA AUTH HGA AUTH METHOD BLANK 01 CONC 1.20 BL#01 <0.200 <0.100 <1.00 <0.100 1 <2.00 %REC DUPL 010 01230209 01260215 01260215 01230209 01230209 01230209 HGA AUTH HGA AUTH BL#02 LCS 01 CONC 21.6 4.10 4.50 49.9 51.0 110 **XREC** 108.0 82.8 90.8 - 99.8 102.0 110.0 DUPL OID 01230209 01260215 01230209 01260215 01230209 01230209 HGA AUTH HGA AUTH BL#03 EXTERNAL QC 01 CONC 16.6 1.69 4.49 282 195 24900 XREC DUPL 01230209 01260215 01260215 01230209 01230209 01230209 **HGA AUTH** HGA AUTH • 1 NI Nickel SE Setenium AG Silver ZH Zinc Barium FE iron

								<u> </u>		_	
	<del>=.</del>					215					
								فتعتبيفيضها فرايجاه لقابل ساران			
	JOB FIL	E: 89723							DATE:	03	Δitr
										• • •	101
	*****	************	****	ENVIRONMENTA	L CHEMISTRY BRANCH	- DATA REPORTING SHEE	T ( PAGE 3 OF	3 ) *******	*****	***	***
				•.	•						
	JOB	DESCRIPTION: GRE	ЕН ВАҮ	MOBILE TRNT	PLANT - OLIN-ESTES	JOB NUMBER:	0054PD-92310183	RECEIPT	DATE:	03.	.St. In
	CHEM. P	RESERVATIVE:				TYPE OF SAMPLE:		COMPLETION	DATE:	3 /	NUG
		COLUMN		13	14						
		ANALYTE			33						
		MG/KG		MN	MO						
	SAMP #	DESCRIPTION									R
	89723	BULK 1,2,3 >2.0	cone	300	1 0 200	1					
	07123	BUCK 1,2,3 >2.0		104.0	0.200	] 					
				385	0.200						
			OID	01230209	01260215	i					
				HGA AUTH	•	•					
	89724	DIEK 1 2 7 -2 0	cove		1 0 (00	•					
	07724	BULK 1,2,3 <2.0	XREC	434	0.699	[					
			DUPL		I I	[ [	•				
				01230209	01260215	1					
				HGA AUTH	•	,					
	BL#01	METHOD BLANK 01	DONG	<0.100	<0.100	•					
			%REC	10.100	1 -5.105	1					
			שמטם		i	i					
			OID	01230209	01260215	Ì					
				HGA AUTH							
	BL#02	LCS 01	CONC	19.6	5.00	ı	÷ v				,
*				98.0	100.2	<u> </u>					*
			DUPL		i	İ					
			OID	01230209 HGA AUTH	01260215	l					
	BL#03	EXTERNAL QC 01	CONC	492	0.997	i					,
			<b>X</b> REC		i	i					5
			DUPL		ŀ	ĺ					
			OID	01230209	01260215						
				HGA AUTH							, y
	MN	Manganese				MC Molybdenum					•
						·					
		•									

ek ilisto.

JOB FILE: 89725

DATE: 17 JUL

	ESCRIPTION: GREE ESERVATIVE:	EN BAY	MOBILE TRNT	PLANT - OLIN-ESTES		UMBER: 0054PD-92 AMPLE: SEDIMENT		RECEIPT DATE: MPLETION DATE:	
	COLUMN		1	2	3	.4	.5	6	
	ANALYTE		137	138	139	140	141	142	
	UG/KG		PC8-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PC8-1254	
SAMP #	DESCRIPTION								
89725	BULK 1,2,3 >2.0	CONC	<15.8	<15.8	<15.8	351	<15.8	<15.8	
•		XREC	74.4	1	1	j	4	ì	
		DUPL		1	1	1	1	İ	į
		OID	54830193	54830193	54830193	54830193	54830183	54830193	Ï
89726	BULK 1,2,3 <2.0	CONC.	×27.1	[ <27.1	·<27.1	I <b>3</b> 278	<b>&lt;</b> 27.1	} <b>&lt;27.1</b>	
		XREC		1	1	1	1 -27-1	[ 521.1]	
		DUPL		j	i	i	i	1	
		OID	54830196	54830196	54830196	54830196	54830196	54830196	
BL#01	METHOD BLANK 01	CONC	<8.3	l <8.3	l <8.3	1 -0.7	1 7	المراج	
DE 0 1	TIETHOO BEARK OF	XREC	<b>~0.</b> 3	1 10.3	<b>.</b> 0.3	<8.3	<8.3	<8.3	
		DUPL		ì	!	i			
		OID	54830193	54830193	54830193	54830193	54830183	54830193	
BL#02	LCS 01	CONC	AR 0	I NZA	N/A	1 11/4	Laure	)	
	200 01	XREC	102.8	1 7/6	1 N/A	N/A	NAÝ	NZA:	
		DUPL	14210	i	i	1	l i	l i	
		OID	54830193	54830193	54830193	54830193 -	54830183	54830193	
PCR-1016	PCB-1016				000 1331 man				
	PCB-1018				PCB-1221 PCB PCB-1242 PCB				
	PCB-1248				PCB-1254 PCB				

JOB FILE: 89725 DATE: 17 JU JOB DESCRIPTION: GREEN BAY MOBILE TRNT PLANT - OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 03 JU: COMPLETION DATE: 17 JU CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT 9 COLUMN..... 7 8 ANALYTE..... 143 145 146 UG/KG..... PCB-1260 TclXYL-S DCLBP DESCRIPTION SAMP # BULK 1,2,3 >2.0 CONC 27.3 93.5% 1 75.3% 89725 XREC 85.2 74.4 DUPL DID 54830193 54830193 54830193 89726 BULK 1,2,3 <2.0 CONC 111 84.0% 84.9% %REC DUPL OID 54830196 54830196 54830196 METHOD BLANK 01 CONC <8.3 1 80.1% BL#01 96.6% %REC DUPL 54830193 54830193 54830193 OID 81.8% BL#02 LCS DI CONC 0.88 99.1% %REC 106.0 DUPL 54830193 54830193 54830193 PCB-1260 PCB-1260 TclXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS Decachlorobiphenyl(Surrogate (60-150 WS)) DCLBP

Jobfile Number: 89725

20

GREEN BAY MOBILE TRNT PLANT - OLIN-ESTES

Project: Account Number: 0054PD-92310183

Date Received: 03 JUL 00

	Sample Ts	t Analyte	% REC	% SDUPL	RPD	OID
89725 89725	89725 14 89725 14 89725 14	5 TclXYL-S	85.2 88.9 74.4	84.8 86.7 73.0	0.5 2.5 1.9	54830193 54830193 54830193

Page 1

END OF REPORT

~ .	
RK.,	
7/17/00	
117	

JOB FILE	: 89727							DATE:	17 JUL
*****	*************	**** [	ENVIRONMENTAL	CHEMISTRY BRANCH	- DATA REPORTIN	G SHEET ( PAGE	1 OF 4 ) ***	*****	******
		N BAY	MOBILE TRNT	PLANT - OLIN-ESTES	108 MÎ			RECEIPT DATE:	_
HEM. PR	ESERVATIVE:				TYPE OF SA	MPLE: SEDIMENT	co	MPLETION DATE:	17 JUL
	COLUMN		1	2	3	4	5	6	
	ANALYTE	• • • • •	290	294	296	297	303	304	
	UG/KG	• • • • •	NAPHTH	ACENAY	ACENAP	FLUORE	PHENAN	ANTRAC	
SAMP #	DESCRIPTION								:
19727	BULK 1,2,3 >2.0	CONC	29.9	<6.4	<6.4	10.8	70.0	10.2	1
		%REC	46.0	50.0	64.0	67.5	71.5	70.5	į
		DUPL		1	1	1	1	1	1
		010	08890198	08890198	08890198	08890198	08890198	08890198	1
9728	BULK 1,2,3 <2.0	соис	513	43.4	72.0	169	1180	215	1
		XREC	•	1	1	ļ	ļ	1	İ
		DUPL				!	!		ļ
		OID	08890198	08890198	08890198	08890198	08890198	08890198	ı
3L#01	METHOD BLANK 01	CONC	<3.3	<b>∤ &lt;3.3</b>	\ \ <3.3	<3.3	<3.3	<3.3	ı
		XREC		İ	1	1	1	1	İ
		DUPL			]	!	!		Ţ
		OID	08890198	08890198	08890198	08890198	08890198	08890198	!
L#02	LCS 01	CONC	36.0	1 34.0	1 44.7	45.3	48.3	1 43.3	
-HVL	200 01		54.0	51.0	67.0	68.0	72.5	65.0	 
		DUPL	- /	1	1	i .	1	i	i
		010	08890198	08890198	08890198	08890198	08890198	08890198	i
	Ventabelen				ABPUAN A				
IAPHTH ICENAP	Naph that ene					enaphthylene Jorene			
HENAN	Acenaphthene Phenanthrene					hracene			

JOB FILE: 89727 DATE: 17 JUL JOB DESCRIPTION: GREEN BAY MOBILE TRNT PLANT - OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 03 JUL CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 17 JUL COLUMN..... 7 9 10 11 12 ANALYTE..... 306 307 309 310 313 314 UG/KG..... FLANTHE PYRENE CHRYSE BAANTHR BBFLANT BKFLANT DESCRIPTION 89727 BULK 1,2,3 >2.0 CONC 99.9 66.2 29.9 53.4 32.4 %REC 85.0 85.0 88.5 94.5 90.0 78.0 DUPL 08890198 08890198 08890198 08890198 08890198 1 08890198 89728 BULK 1,2,3 <2.0 CONC 1690 1570 992 720 762 521 XREC DUPL 08890198 08890198 DID 08890198 08890198 08890198 08890198 8L#01 METHOD BLANK 01 CONC <3.3 <3.3 <3.3 <3.3 ₹3.3 | <3.3 XREC DUPL OID 08890198 08890198 08890198 08890198 08890198 08890198 BL#02 LCS 01 CONC 50.0 42.3 59.3 51.0 60.0 61.0 %REC 75.0 63.5 89.0 76.5 90.0 91.5 DUPL 010 08890198 08890198 08890198 08890198 08890198 08890198 FLANTHE PYRENE Pyrene CHRYSE Chrysene BAANTHR Benzo(a)Anthracene BBFLANT Benzo(b) Fluoranthene BKFLANT Benzo(k)Fluoranthene

T. 1975 SECTION

JOB FILE: 89727 DATE: 17 JUI JOB DESCRIPTION: GREEN BAY MOBILE TRNT PLANT - DLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 03 JUL CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 17 JUL COLUMN...... 13 14 15 16 17 18 ANALYTE..... 315 316 317 318 322 327 UG/KG..... BAPYRE 1123PYR DBAHANT B-GHI-PY 2MeNAPH 2FLBP-S SAMP # DESCRIPTION BULK 1,2,3 >2.0 CONC 35.6 39.4 5.1 J 48.3 31.8 72.6% %REC 79.0 92.0 0.88 88.5 62.5 DUPL OID 08890198 08390198 08890198 08890198 08890198 08890198 89728 BULK 1,2,3 <2.0 CONC 747 1 637 105 678 574 1 52.4% **XREC** DUPL CID 08890198 08890198 08890198 08890198 08890198 08890198 BL#01 METHOD BLANK 01 CONC <3.3 | <3.3 | <3.3 | <3.3 77.6% %REC DUPL 010 08890198 08890198 08890198 08890198 08390198 08890198 BL#02 LCS 01 CONC 50.0 54.7 60.3 57.7 40.3 67.6% %REC 75.0 82.0 90.5 86.5 60.5 DUPL 08890198 08890198 08890198 08890198 08890198 08890198 BAPYRE Benzo(a)Pyrene 1123PYR Indeno(1,2,3-C,0)Pyrene DBAHANT Dibenzo(A,H)Anthracene B-GHI-PY Benzo(G,H,1)Perylene 2McNAPH 2-Methylnaphthalene 2FlBP-S 2-Fluorobiphenyl(Surrogate (30-115 S)) ٠,

```
JOB FILE: 89727
                                                                                          DATE: 17 JUL
     JOB DESCRIPTION: GREEN BAY MOBILE TRNT PLANT - DLIN-ESTES
                                                                                    RECEIPT DATE: 03 JUL
                                                        JOB NUMBER: 0054PD-92310183
     CHEM. PRESERVATIVE:
                                                     TYPE OF SAMPLE: SEDIMENT
                                                                                  COMPLETION DATE: 17 JUL
                COLUMN...... 19
                ANALYTE..... 328
                UG/KG.... PTERP-S
     SAMP # DESCRIPTION
                                                                                                    Ś
            BULK 1,2,3 >2.0 CONC 64.9%
                        XREC 63.5
                        DUPL
                            08890198
                        010
           BULK 1,2,3 <2.0 CONC 63.4%
     89728
                        XREC
                        DUPL
                        OID
                             08890198
           METHOD BLANK 01 CONC 65.2%
                        ZREC
                        DUPL
                        OID 08890198
台
     BL#02
           LCS 01
                        CONC 58.8%
                        XREC
                        DUPL
                        010 08890198
     PTERP-S p-Terphenyl-D14(Surrogate (18-137 S))
```

Jobfile Number: 89727
Project: GREEN BAY MOBILE TRNT PLANT - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 03 JUL 00

Job#	Sample	Tst	Analyte	% REC	% SDUPL	RPD	OID
89727	89727	290	NAPHTH	46.0	56.0	19.6	08890198
89727	8972 <b>7</b>	294	ACENAY	50.0	49.5	1.0	08890198
89727	89727	296	ACENAP	64.0	67.5	5.3	08890198
89727	8972 <b>7</b>	297	FLUORE	67.5	67.5	0.0	08890198
89727	89727	303	PHENAN	71.5	73.5	2.8	08890198
89727	89727	304	ANTRAC	70.5	73.0	3.5	08890198
89727	89727	306	FLANTHE	85.0	98.0	14.2	08890198
89727	89727	307	PYRENE	85.0	88.5	4.0	08890198
89727	89727	309	CHRYSE	88.5	89.5	1.1	08890198
89727	89727	310	BAANTHR	94.5	96.0	1.6	08890198
89727	89727	313	BBFLANT	90.0	90.0	0.0	08890198
89727	89727	314	BKFLANT	78.0	74.0	5.3	08890198
89727	89727	315	BAPYRE	79.0	84.0	6.1	08890198
89727	89727	316	I123PYR	92.0	87.0	5.6	08890198
89727	89727	317	DBAHANT	88.0 ,	81.5	7.7	08890198
89727	89727	318	B-GHI-PY	88.5	82.5	7.0	08890198
89727	89727	322	2MeNAPH	56.0	66.0	16.4	08890198
89727	89727	327	2F1BP-S	62.5	69.0	9.9	08890198
89727	89727	328	PTERP-S	63.5	63.9	0.6	08890198

Page 1

END OF REPORT

	DESCRIPTION: GREE RESERVATIVE:	N BAY	MOBILE TRNT I	PLANT - OLEN-ESTES		UMBER: 0054PD-92310183 AMPLE: SECTIMENT	RECEIPT DATE: 03 J
	COLUMN		1	<sup>14</sup> 2	3	4	COMPLETION DATE: 14 JU
	ANALYTE		86	95	100	104	
	MG/KG		TOC	TVS	O&G	TRPH	
SAMP #	DESCRIPTION						
89729	BULK 1,2,3 >2.0	CONC	27800	- <4	67	54 B	
		DUPL	28400	<u> </u>	1		
	•	OID	60040193	10150188	55990189	55990191	
89730	BULK 1,2,3 <2.0	CONC	47700	∫ <b>&lt;</b> 4	1 640	350 в	
		%REC		İ			
		DUPL OID	60040193	1 10150188	55990189	55990191	•
		•			A*		
BL#01	METHOD BLANK 01	CONC	<100	.<4	<b>&lt;</b> 35	L8	·
	÷.	DUPL	.60040193	10150188	55990189	55990191	
			•	•	•		
BL#02	LCS 01	CONC	9890	I N/A	932	948	
		XREC DUPL	98.9	l.	91.7	93.3	
		010	60040193	10150188	55990189	55990191	
BL#03	EXTERNAL QC 01	CONC	19000	į, N/A	N/A	[.N/A ]	
		XREC DUPL		-			
		OID	60040193	10150188	55990189	55990191	
	,						
TOC O&G	Total Organic C Oil and Grease	arbon				tal Volatile Solids tal Recoverable Petroleum H	ydrocarbons

Jobfile Number: 89729
Project: GREEN BAY MOBILE TRNT PLANT - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 03 JUL 00

Job#	Sample	Tst	Analyte	% RE	s SDUPL	RPD	OID
	BL#02 BL#02			91.7 93.3	91.2 93.0	0.5 0.3	55990189 55990191

Page 1

END OF REPORT

• 5

DATE: 31 AND 6

	ERVATIVE: NONE	:			TYPE OF SAI	MPLE: WATER	310183 (	RECEIPT DATE:	30 AUG
	COLUMN	,	1	2	3	4	5	6	
	ANALYTE		137	138	139	140	141	142	
	PP8		PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	
MP# D	ESCRIPTION								
789 G	REEN BAY	CONC	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	ı
s	UPPLY WATER	<b>XREC</b>		j		Ì	1	1	İ
8	/10/00 0930	DUPL		İ	1		l	Į.	1.
		OID	54830238	54830238	54830238	54830238	54830238	54830238	ļ
	ETHOD BLANK 01	CONC	<0.25	<0.25	<0.25	<0.25	<0.25	<0.25	ļ
* +		%REC			!	ļ.	] 1	1	- 1
		DUPL	54830238	54830238	54830238	54830238	54830238	54830238	
				•					
#02 L	cs 01	CONC	0.24	N/A	N/A	N/A	N/A	N/A	- 1
		XREC	96.0			ĺ	ſ	1	1
		DUPL		Ì	l	1 .	I.	1	1
		DID	54830238	54830238	54830238	54830238	54830238	54830238	

DATE: 31 AUG C JOB FILE: 90789 RECEIPT DATE: 15 AUG ( JOB NUMBER: 0054PD-92310183 JOB DESCRIPTION: GREEN BAY - OLIN-ESTES CHEM. PRESERVATIVE: NONE COMPLETION DATE: 30 AUG ( TYPE OF SAMPLE: WATER COLUMN..... 7 145 146 ANALYTE..... 143 PPB..... PCB-1260 TCLXYL-S DCLBP RC SAMP # DESCRIPTION 67.5% 71.3% 90789 GREEN BAY CONC <0.24 SUPPLY WATER %REC 8/10/00 0930 DUPL 54830238 010 54830238 54830238 METHOD BLANK 01 CONC <0.25 77.9% 75.3% %REC DUPL 010 54830238 54830238 54830238 77.8% 74.9% CONC 0.24 BL#02 LCS D1 %REC 96.0 DUPL 54830238 54830238 OID 54830238 TolXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(40-140 WS PCB-1260 PCB-1260 DCLBP Decachlorobiphenyl(Surrogate (40-140 WS))

JA 57 60 90808

DATE: 31 AUG 0

	ESCRIPTION: GREE	N BAY	OLIN-ESTES			MBER: 0054PD-9		RECEIPT DATE: EMPLETION DATE:	
	COLUMNI	· • • • • ·	`1	2	3	4.	-5	6	
	ANALYTE			138	139	140	141	142	
	UG/KG		PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	
AMP #	DESCRIPTION								
0808	GREEN BAY	CONC	<8.69	<8.69	<8.69	143	<8.69	<8.69	ĵ
	1400-1 8/10/00	XREC	134.8		ļ	ļ	ļ	ļ	!
	UNDERFLOW	DUPL	n	1 5/970279	   54830238	   54830238	54830238	   54830238	ł
	7	010	54830238	54830238	34830230	1 34630230	1 34030230	1 34030230	ļ
0809	GREEN BAY	CONC	<908	<9.08	<9.08	154	<9.08	<9.08	1.
	1400-2 8/10/00	%REC		Ï	l .	· [	. !	ŀ	İ
	UNDERFLOW	DUPL				   54830238	54830238	   54830238	
	•	OIO	54830238	54830238	54830238	34630236	1 2402020	34030230	1.
0810	GREEN BAY	CONC	<9.37	<9,37	<9.37	88.3	<9.37	<9.37	[
uoio	1505-1 8/10/00	XREC			i	i "	j	1.	ĺ
	UNDERFLOW	DUPL			!		1 54070370	   54830238	- 1
		OID	54830238	54830238	54830238	54830238	54830238	1 34630230	ı
0811	GREEN BAY	CONC	<8.80	1 <8.80	<8.80	126	<8.80	<8.80	1
0011	1505-2 8/10/00	%REC		i	i	ĺ	į.	į	- !
	UNDERFLOW	DUPL	•	İ	1		1 54070070	54830238	- }
		010	54830238	54830238	54830238	54830238	54830238	34030230	. 1
0812	GREEN BAY	CONC	<8.88	l <8.88	l <8.88	1 153	<8.88	<8.88	ı
10012	1525-1 8/10/00	ZREC			i	į	İ	į ·	- 1
	UNDERFLOW	DUPL				1 5/07077	1 54830238	i 54830238	  -
		OID	54830238	54830238	54830238	54830238	1 24020530	1 34030636	
20813	GREEN BAY	CONC	<8.93	<8.93	I <8.93	160	[ <8.93	<8.93	1
0013	1525-2 8/10/00	7REC	-0172			i	i	į ·	- 1
	UNDERFLOW	DUPL		1	1	1	1 5 1070077	1 51070070	ļ
		CID	54830238	54830238	54830238	54830238	54830238	54830238	I
200 - 104	6 PCB-1016		٠		PCB-1221 PC	B-1221			
	12 PCB-1232				PCB-1242 PC				
	8 PCB-1248				PCB-1254 PC	8-1254			

DATE: 31 AUG ( JOB .FILE: . 90808 ; JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 17 AUG ( JOB DESCRIPTION: GREEN BAY - OLIN-ESTES TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 31 AUG ( CHEM, PRESERVATIVE: COLUMN..... 1 5 141 142 ANALYTE..... 137 138 139 140 UG/KG..... PCB-1016 PCB-1221 PCB-1232 PCB-1242 PCB-1248 PCB-1254 SAMP # DESCRIPTION 90814 GREEN BAY CONC <9.21 <9.21 <9.21 154 <9,21 <9.21 1625-1 8/10/00 %REC DUPL UNDERFLOW 54830238 54830238 OID 54830238 54830238 54830238 54830238 90815 GREEN BAY CONC <9.02 <9.02 <9.02 180 <9.02 1 <9.02 **XREC** 1625-2 8/10/00 UNDERFLOW DUPL OID 54830238 54830238 54830238 54830238 54830238 54830238 1 130 <8.60 | <8.60 1 <8.60 <8.60 90816 GREEN BAY CONC <8.60 1715-1 8/10/00 XREC DUPL UNDERFLOW 54830238 54830238 54830238 54830238 54830238 010 54830238 90817 GREEN BAY CONC <8.87 | <8.87 <8.87 152 <8.87 1 <8.87 1715-2 8/10/00 **XREC** UNDERFLOW DUPL OID 54830238 54830238 54830238 54830238 54830238 54830238 | <16.3 <16.3 <16.3 <16.3 GREEN BAY FEED CONC <16.3 90818 1400-1 8/10/00 TREC DUPL 54830238 010 54830238 54830238 54830238 54830238 54830238 <17.4 | <17.4 | <17.4 2999 90819 GREEN BAY FEED CONC <17.4 I <17.4 1501-1 8/10/00 %REC DUPL 54830238 OID 54830238 54830238 54830238 54830238 54830238 PCB-1221 PCB-1221 PCB-1016 PCB-1016 PCB-1242 PCB-1242 PCB-1232 PCB-1232 PCB-1254 PCB-1254 PCB-1248 PCB-1248

	ESCRIPTION: GREE ESERVATIVE:	EN BAY	- OLIN-ESTES			MBER: 0.054PD-92 MPLE: SEDIMENT		RECEIPT DATE:	
	CCLUMN		1	2	3	4	<b>5</b> :.	6	
	ANALYTE		137	138	139	140	141	142	
	UG/KG	• • • • • •	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PCB-1254	
SAMP #	DESCRIPTION								
0820	GREEN BAY FEED	CONC	<13.2	<13.2	<13.2	2137	1 <13.2	<13.2	ł
	1525-1 8/10/00	%REC		i .	1	Ì		Í	i
		DUPL		1	İ.	İ.	į	İ	İ
		OID	54830238	54830238	54830238	54830238	54830238	54830238	ĺ
			narin	1144.5	I was n	LOACE	1 344 5	line o	
90821	GREEN BAY FEED 1625-1 8/10/00	ZREC	<14.2	1 <14.2	<14.2	2108	<14.2	<14.2	-
	1023 1 0) 10/00	DUPL			1	ì	i	i	-
		OID	54830238	54830238	54830238	54830238	54830238	54830238	į
						1 45 46	l' à		
0822	1715-1 8/10/00	CONC	<12.1	<12.1	<b>1 &lt;12,1</b>	1969	[ <1,2.1	<12.1	-
	3712-1 9710700	DUPL		i	•	I. I			H
		OID	54830238	54830238	54830238	54830238	54830238	54830238	i
			ar	1 or be	المناهة	1 05	i de es	1 diam	,
3L#01	METHOD BLANK 01	%REC	<6.25	<6.25 	<6.25	<6.25	<6.25	<6.25	ł
		DUPL		i		i	i	i	i
		OID	54830238	54830238	54830238	54830238	54830238	54830238	i
				1		1	1	1	
3L#02	LCS 01	CONC	0.625 100.0	N/A	N/A	N/A	N/A	J N/A	ŀ
		DUPL	100.0	-		1		}	l
		OID	54830238	54830238	54830238	54830238	54830238	54830238	i
	PCB-1016				PCB-1221 PCB				
°CB-1232	PCB-1232				PCB-1242 PCB	-1242			

DATE: 31 AUG ( JOB. FILE: 90808 JOB NUMBER: 0054PD-92310183 JOB DESCRIPTION: GREEN BAY - CLIN-ESTES RECEIPT DATE: 17 AUG ( TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 31 AUG ( CHEM. PRESERVATIVE: COLUMN..... 7 10 145 900 ANALYTE..... 143 146 UG/KG..... PCB-1260 TclXYL.S DCLBP % MOISTU SAMP # DESCRIPTION RC 83.5% GREEN BAY CONC 13.7 83.2% 16% 81.6 65.8 1400-1 8/10/00 %REC 89.6 UNDERFLOW DUPL 1 54830238 54830238 55150234 DID 54830238 90809 GREEN BAY CONC 21.2 80.5% 87.0% 19.1% 1400-2 8/10/00 %REC UNDERFLOW DUPL 010 54830238 54830238 54830238 55150234 90810 CONC 7.48 J 1 82.8% 76.6% 21.6% GREEN BAY 1505-1 8/10/00 **XREC** UNDERFLOW DUPL 54830238 55150234 010 54830238 54830238 90811 GREEN BAY CONC 3.69 J 82.4% 74.8% 16.6% 1505-2 8/10/00 ZREC UNDERFLOW DUPL 54830238 55150234 OID 54830238 54830238 87.3% 74.7% 18.1% 90812 GREEN BAY CONC 7.23 J 1525-1 8/10/00 **X**REC UNDERFLOW DUPL 54830238 54830238 54830238 55150234 OID 1 85.5% 86.6% 18.5% 90813 GREEN BAY CONC 14.9 1525-2 8/10/00 %REC UNDERFLOW DUPL OID 54830238 54830238 54830238 55150234 TclXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(40-140 WS PCB-1260 PCB-1260 % MOISTU PERCENT MOISTURE Decachlorobiphenyl(Surrogate (40-140 WS))

	ESCRIPTION: GRE	EN BAY	- OLIN-ESTES			MBER: 0054PD-92310183 MPLE: SEDIMENT	RECEIPT DATE: 17 AU
	COLUMN		7	8	.:9"	10	
	ANALYTE		143	145	146	900	
	UG/KG	• • • • • •	PCB-1260	TCLXYL-S	DCLBP	% HOISTU	
SAMP #	DESCRIPTION						
20814	GREEN BAY 1625-1 8/10/00 UNDERFLOW	CONC XREC DUPL	14.5	79-4%	90.8%	[ 21.2% ] [ ]	
	GUNDERFEON	010	54830238	54830238	54830238	55150234	
90815	GREEN BAY 1625-2 8/10/00	%REC	12.4	78.4% 	71.4% 	19.7%	
	ÜNDERFLÖN	OID	54830238	54830238	54830238	55150234	
70816	GREEN BAY		14.3	76.6X	91.2%	16.0%	
	1715-1 8/10/00 UNDERFLON	XREC DUPL OID	54830238	54830238	54830238	55150234	
			•	•	• • •	•	
0817	GREEN BAY 1715-2 8/10/00	CONC	9.70	74.8%	66.8%	17.3%	
	UNDERFLOW	OID	54830238	54830238	54830238	55150234	
20818	GREEN BAY FEED	CONC	164	811.2%	91.4%	[ 52.5% ]	
	1400-1 8/10/00	%REC	,51				
		OID	54830238	54830238	54830238	55150234	
0819	GREEN BAY FEED 1501-1 8/10/00	CONC %REC	236	80.9% 	97.1%	55.5%	
		OID	54830238	54830238	54830238	55150234	

000, 112	E: 90808							DATE: 31	ΑU
*****	*******	****	ENVIRONMENTAL	CHEMISTRY BRANC	H - DATA REPORTI	NG SHEET ( PAGE (	6 OF 6 ) *****	******	***
•						•			
	DESCRIPTION: GRE RESERVATIVE:	EN BAY	- OLIN-ESTES			IUMBER: 0054PD-923 AMPLE: SEDIMENT		ECEIPT DATE: 17 LETION DATE: 31	
	COLUMN ANALYTE UG/KG			8 145 TclXYL-S	9 146 DCLBP	10 900 % HOISTU			
SAMP #	DESCRIPTION								
90820	GREEN BAY FEED 1525-1 8/10/00	<b>X</b> REC	166	78.3%	98.7%	41.1% 			
		DUPL OID	54830238	   54830238	   54830238	   55150234	1		
90821	GREEN BAY FEED 1625-1 8/10/00	CONC XREC	160	79.2% 	86.2%	44.9%	i i		
		DUPL	54830238	   54830238	   54830238	   55150234	1		
90822	GREEN BAY FEED 1715-1 8/10/00	CONC 2REC	163	78.8%	90.5%	36.3% 	ļ ļ		
		DUPL	54830238	54830238	54830238	   55150234	1		
BL#01	METHOD BLANK 01	CONC XREC DUPL	<6.25	95.2% 	83.1%	N/A 	<b> </b>  -		
		010	54830238	54830238	54830238	55150234	İ		
BL#02	LCS 01		0.635 101.6	95.7% 	81.3%	N/A 	   		
		OID	54830238	54830238	54830238	55150234	İ		
PCB-1260 PCLBP	PCB-1260 Decachlorobiphe	nyl (Su	rrogate (40-1	40 WS))	Tolxyl-s 2,4	,5,6-Tetrachloro-m- CENT MOISTURE	-xylene(Surrogate	≘(40-140 WS	

Jobfile Number: Project: 90808

GREEN BAY - OLIN-ESTES 0054PD-92310183

Account Number:

Date Received: 17 AUG 00

Job#	Sample	Tst	Analyte	% REC	% SDUPL	RPD	OID
90808	90808	137	PCB-1016	134.8	154.4	13.6	54830238
90808	90808	143	PCB-1260	89.6	97.2	8.1	54830238
90808	90808	145	TclXYL-S	81.6	87.2	6.6	54830238
90808	90808	146	DCLBP	65.8	78.1	17.1	54830238

Page 1

END OF REPORT

		[	ENVIRUNMENTAL C	JENISIKI BRANC	.n - DATA REPORTI	ING SHEET ( PAGE	3 OF 9)**		
	DESCRIPTION: GRE	EN BAY	- OLIN-ESTES			NUMBER: 0054PD-93 SAMPLE: SEDIMENT		RECEIPT DATE: OMPLETION DATE:	
	COLUMN			5	3	4	5	6	
	ANALYTE MG/KG			4 CD	5 Cr	6 CU	7 P8	8 HG	
	nay karry	••••	7.5	Co	un.	CG	7.0	nu .	
SAMP #	DESCRIPTION								5
90835	GREEN BAY FEED 1525-1 8/10/00	CONC %REC DUPL	1.42	0.250	15.2 	15.9 	16.6	0.378 	
		010	04360291	04360262 HGA AUTH	D1230286 HGA AUTH	01260269 HGA AUTH	01230286 HGA AUTH	04650252	i
90836	GREEN BAY FEED 1625-1 8/10/00	CONC XREC DUPL	2.93	0.640 · 	45.5   	39.8 	45.1 	0.900 	 
		OID	04360291	04360262 HGA AUTH	01230286 HGA AUTH	01260269 HGA AUTH	01230286 HGA AUTH	04650252	1
90837	GREEN BAY FEED 1715-1 8/10/00	CONC XREC DUPL	1.98	0.380   	26.3   	25.5	25.6   	0.470	
		OID	04360291	O4360262 HGA AUTH	01230286 HGA AUTH	01260269 HGA AUTH	01230286 HGA AUTH	04650252	i
BL#01	METHOD BLANK 01	CONC %REC DUPL	<0.200	<0.020   	<0.100   	0.100	0.100   	<0.040 	   
		OID	04360291	1 01260269 HGA AUTH	01230286 HGA AUTH	01260269 HGA AUTH	01230286 HGA AUTH	04650252	j
BL#02	LCS 01	CONC %REC DUPL	9.50 94.5	4.99   99.8 	22.4   112.0	21.8   109.0	11.5   115.8 	0.072 96.0	
		010	04360291	01260269 HGA AUTH	01230286 HGA AUTH	01260269 HGA AUTH	01230286 HGA AUTH	04650252	İ
BL#03	EXTERNAL QC 01	CONC XREC DUPL	79.1	36.8	16.6	112   	119	0.054 90.0	
		CID	04360291	01260269 HGA AUTH	01230286 HGA AUTH	01260269 HGA AUTH	01230286 HGA AUTH	04650252	İ
AS CR PB	Arsenic Chromium Lead				CU Eo	dmíum pper rcury			

DATE: 23 OCT (

	ESCRIPTION: GREE	N BAY	- OLIN-ESTES			NUMBER: 0054PD- SAMPLE: SEDIMEN	92310183 T	RECEIPT DATE: COMPLETION DATE:	
	COLUMN		7	8	9	10:	11	12	
	ANALYTE			10	-11	13	25	30	
	MG/KG			\$E	AG	ZN	BA	FE	
SAMP #	DESCRIPTION			i i					
00823	GREEN BAY	CONC	2.40	<0.200	0.100	5.50	9.29	j 1830	Ì
,,,,,,	1400-1 8/10/00		101.0	84.0	100.0	84.4	96.2	0.08	1
	UNDERFLOW	DUPL	2.40	<0.200	0.100	5.50	9.49	1820	
		OID	01260269	01260269	01260269	01260269	01260269	01260269	1
			HGA AUTH		HGA AUTH				
90824	GREEN BAY	CONC	2 40	0.200	0.300	1 5.09	4.99	1730	1
FUUL	1400-2 8/10/00	%REC				i	i	Ì	j
	UNDERFLOW	DUPL		ì	i	i	i	i	i
	OUDEKLEON	OID	01260269	01260269	01260269	01260269	01260269	01260269	i
		O.D	HGA AUTH	1	HGA AUTH	•	•		•
			iller herri						
90825	GREEN BAY	CONC	3.09	1 <0.200	<0.100	5.08	3.19	1540	l
,00L3	1501-1 8/10/00	%REC	. 7 1		i	i	į	. 1	ľ
	UNDERFLOW	DUPL			i	j ,	j	1	l
•	UNDER! ZON		01230286	04360291	04360297	01230286	01230286	01230286	:1
			HGA AUTH	.•	HGA AUTH			*	
	15 10 10 1			( -a : 200	0.100	1 4.59	3.70	1400	i
90826	GREEN BAY	CONC	2.00	[ <0.200	1 0.100	1 41.27	1 3.00	1 1794	ŀ
	1505-2 8/10/00	%REC		<u>:</u>	ļ.	4	· I	i i	i
	UNDERFLOW	DUPL		1 01340340	01260269	01230286	01230286	01230286	i
		OID	01230286	01260269		1 01230200	1 01220200	1 01230200	•
			HGA AUTH		HGA AUTH				
90827	GREEN BAY	coic	2.40	<0.200	0.100	5.69	5.09	2070	1
70021	1525-1 8/10/00	XREC	2,70	1.	1	i	į	Ì	İ
	UNDERFLOW	DUPL		ŀ	i	i	i	j <sup>r</sup>	1.
	ONDEK! COM	DID	01230286	01260269	01260269	01230286	01230286	01230286	İ
		0.5	HGA AUTH	,	HGA AUTH		• • • • • • • • • • • • • • • • • • • •		
90828	GREEN BAY	CONC	2.30	<0.200	0.100	5.99	5.99	1910	1
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1525-2 8/10/00	%REC	777.	1	i	i	1		- 1
	UNDERFLOW	DUPL		i	i	i	1.	1	- 1
	UNDER! COW	OID	01230286	01260269	01260269	01230286	01230286	01230286	ļ
			HGA AUTH	• • •	HGA AUTH	<del>-</del>	•		
	Winted				SE	Selenium			
NI	Nickel				ZN	Zinc	•		
AG	Silver				FE	Iron			
BA	Barium			•	1.4				

DATE: 23 OCT ( JOB FILE: 90823 JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 17 AUG ( JOB DESCRIPTION: GREEN BAY - OLIN-ESTES COMPLETION DATE: 14 SEP ( TYPE OF SAMPLE: SEDIMENT CHEM. PRESERVATIVE: 12 COLUMN...... 7 10 11 8 25 30 13 11 ANALYTE..... 9 10 RA FE ZN MG/KG..... NI SAMP # DESCRIPTION 4.79 1400 1 3.69 CONC 1.80 <0.200 0.100 GREEN BAY 90829 1625-1 8/10/00 %REC DUPL UNDERFLOW 01230286 01230286 01230286 01260269 01260269 010 01230286 HGA AUTH | 2510 CONC 3.10 <0.200 <0.100 1 6.79 5.59 90830 GREEN BAY 1625-2 8/10/00 **XREC** UNDERFLOW DUPL 01230286 01260269 04360297 01230286 01230286 010 01230286 HGA AUTH 5.19 2580 5.99 CONC 3.49 l <0.200 I <0.100 90831 GREEN BAY 93.0 101.2 %REC 99.2 93.B 102.0 93.4 1715-1 8/10/00 5-09 2530 <0.200 <0.100 5.89 UNDERFLOW DUPL 3.29 01230286 01230286 01230286 04360297 OID 01230286 04360291 HGA AUTH HGA AUTH 3.80 1820 4.80 CONC 2.80 <0.200 <0.100 GREEN BAY 90832 1715-2 8/10/00 %REC UNDERFLOW DUPL 01230286 01230286 01230286 04360291 OID 01230286 04360297 HGA AUTH HGA AUTH 1.20600 120 95.7 1 0.799 90833 GREEN BAY FEED CONC 23.7 XREC 1400-1 8/10/00 DUPL 01230286 01230286 04360291 04360297 01230286 CID 01230286 HGA AUTH HGA AUTH 82.1 18600 101 0.410 CONC 22.5 0.799 90834 GREEN BAY FEED 1505-1 8/10/00 XREC DUPL 01230286 01230286 04360291 04360297 01230286 OID 01230286 HGA AUTH HGA AUTH SE Selenium NI Nickel ZN Zinc Silver AG FE Iron Bacium

FE

Iron

Silver

Barium

AG

JOB FILE	90823							DATE:	23 001
			NATIONNENTAL C	HEMISTRY BRANCH	- DATA REPOR	TING SHEE	T ( PAGE 7 OF 9	) **************	*****
***	******	5	MATKONILENTAL C						
	•						005/00 00710107	RECEIPT DATE:	17 At 16
JOB D	ESCRIPTION: GREEN	BAY .	- OLIN-ESTES				Q054PD-92310183 SEDIMENT	COMPLETION DATE:	
CHEM. PR	ESERVATIVE:				TIPE OF	JAH EL	<b>J</b>	•	
	COLUMN	<b>-</b>	13	14					
	ANALYTE		32	33					
	MG/KG		MN	MO					
SAMP #	DESCRIPTION								
90823	GREEN BAY	CONC	48.8	0.100	1				
,0025	1400-1 8/10/00	XREC	99.0	102.2	!				
	UNDERFLOW	DUPL	48.3	0.100	-				•
		OID	01260269	01260269	ı				
			HGA AUTH						
0083/	GREEN BAY	CONC	60.5	0.100	1				
90824	1400-2 8/10/00	XREC	2012	i	į				
	UNDERFLOW	DUPL		1					
	•	OID	01260269	01260269	1				
			HGA AUTH						
5000E	GREEN BAY	CONC	34.9	<1.00	1				
90825	1501-1 8/10/00	%REC	•	i	ĺ				
	UNDERFLOW	DUPL		Ì	l				
		OID	01230286	01260269	l			•	
			HGA AUTH						
		CONC	44.9	<1.00	ı				
90826	GREEN BAY 1505-2 B/10/00	%REC			j				
	UNDERFLOW	DUPL		Ì	1				
		OID	01230286	01260269	ı				
			HGA AUTH						
60977	GREEN BAY	CONC	56.6	0.100	ł	•			
90827	1525-1 8/10/00	%REC		i	1				
	UNDERFLOW	DUPL		1					
		OID	01230286	01260269	Į				
			HGA AUTH						
*****	entry nav	CONC	: 48.5	0.100	1				
90828	GREEN BAY 1525-2 8/10/00	%REC		1	i				
	UNDERFLOW	DUP		į	1				
	-,,	OID	01230286	01260269	l				
			HGA AUTH						
					MC	Molybde	num		
MN	Manganese								
•									
	•								
						-			

DATE: 23 OCT ( JOB FILE: 90823 JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 17 AUG I JOB DESCRIPTION: GREEN BAY - OLIN-ESTES COMPLETION DATE: 14 SEP ( TYPE OF SAMPLE: SEDIMENT CHEM. PRESERVATIVE: COLUMN...... 13 33 ANALYTE..... 32 МО MG/KG..... MN R SAMP # DESCRIPTION GREEN BAY FEED CONC 137 | <1.00 90835 1525-1 8/10/00 XREC DUPL 01260269 OID 01230286 HGA AUTH GREEN BAY FEED CONC 257 90836 1625-1 8/10/00 XREC DUPL 01260269 OID 01230286 <1.00 GREEN BAY FEED CONC 180 90837 1715-1 8/10/00 XREC DUPL 01260269 OID 01230286 HGA AUTH METHOD BLANK 01 CONC <0.100 BL#01 %REC DUPL 01260269 OID 01230286 HGA AUTH CONC 22.8 1 N/A LCS 01 %REC 114.0 DUPL 01260269 010 01230286 HGA AUTH 0.400 EXTERNAL QC 01 CONC 539 BL#03 %REC DUPL OTD 01230286 01260269 HGA AUTH Molybdenum Manganese

DATE: 30 AUG (

0838	COLUMN ANALYTE MG/KG DESCRIPTION		1 86	2.				
0838	MG/KG		86	-	3	4		
0838			w	95	100	104		
0838	DESCRIPTION		201	TVS	O&G	TRPH		
							· · · · · · · · · · · · · · · · · · ·	
	GREEN BAY	CONC	1130	<4	<38.0	<38.0		
1	1400-1 8/10/00	XREC		t	88.5	91.9		
•	UNDERFLÖW	DUPL	1350	1	İ			
		OID	60040240	10150235	55990239	55990242		
0839	GREEN BAY	CONC	391	<4	16.0 J	<43		
,	1400-2 8/10/00	XREC		1				
.1	UNDERFLOW	DUPL	1917	1	<b>1</b> ;			
		OID	60040240	10150235	55990239	55990242		
•								
	GREEN BAY	CONC	412	<4	] <44.0	<44.0		
	1505-1 8/10/00	XREC		ļ	<u>į</u>	]		
· '	UNDERFLOW	DUPL	(00/07/0	10450075		1.55000373		
		DID	60040240	10150235	55990239	55990242		
0841 i	GREEN BAY	CONC	682	<4	<b>&lt;41.0</b>	<41.0		
	1505-2 8/10/00	XREC		i	1	1		
	UNDERFLOW	DUPL		ì	i	- i i -		
·		OID	60040240	10150235	55990239	55990242		
					•			
0842	GREEN BAY	CONC	530	<b>  &lt;4</b>	21.0 J	∢43		
	1525-1 8/10/00	XREC			1	1 -	•	
	UNDERFLOW	DUPL		1	- I	1 . 1		
		GID	60040240	10150235	55990239	55990242		•
100/7	CDFCU 014	0000	1430	t at	i ez o i	<43		
	GREEN BAY	CONC	1620	<u>  &lt;4</u>	[ 13.0 J	[ 745		
	1525-2 8/10/00	XREC		ļ	1	<u> </u>		
	UNDERFLOW	DUPL	30010510		EEGGGGGG	1 55000242		
		OID	60040240	10150235	55990239	55990242		

JOB FILE: 90838 DATE: 30 AUG C JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 17 AUG ( JOB DESCRIPTION: GREEN BAY - OLIN-ESTES COMPLETION DATE: 30 AUG C CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COLUMN...... 1 100 104 ANALYTE..... 86 95 MG/KG..... TOC TVS 0&G TRPH DESCRIPTION RC <44 23.0 1 GREEN BAY CONC 765 | <4 1625-1 8/10/00 %REC UNDERFLOW 10150235 55990239 55990242 GID 60040240 | <43 GREEN BAY CONC 2570 | 10.0 J 1625-2 8/10/00 **XREC** UNDERFLOW DUPL 55990242 10150235 55990239 GID 60040240 1 <4 I 10.0 J GREEN BAY CONC 850 90846 1715-1 8/10/00 UNDERFLOW DUPL 10150235 55990239 55990242 OID 60040240 90847 GREEN BAY CONC 1240 | <4 <42.0 1 <42 1715-2 8/10/00 ZREC DUPL 55990242 OID 60040240 10150235 55990239 160 90848 GREEN BAY FEED CONC 28900 200 1400-1 8/10/00 XREC DUPL 10150235 55990239 55990242 DID 60040240 460 370 GREEN BAY FEED CONC 35800 <4 90849 1505-1 8/10/00 **X**REC DUPL 55990242 OID 60040240 10150235 55990239 TVS Total Volatile Solids TOC Total Organic Carbon Total Recoverable Petroleum Hydrocarbons Oil and Grease TRPH

JOB FILE: 90838 DATE: 30 AUG ( JOB DESCRIPTION: GREEN BAY - OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 17 AUG ( CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 30 AUG ( COLUMN..... 1 95 ANALYTE..... 86 100 104 MG/KG..... TOC 230 TRPH SAMP # DESCRIPTION R٤ 90850 GREEN BAY FEED CONC 21300 270 200 1525-1 8/10/00 XREC DUPL OID 60040240 10150235 55990239 55990242 <4 90851 GREEN BAY FEED CONC 30400 1 280 230 1625-1, 8/10/00 XREC DUPL 010 60040240 10150235 55990239 55990242 90852 GREEN BAY FEED CONC 14400 370 280 1715-1 8/10/00 %REC | <4 DUPL 10150235 OID 60040240 55990239 55990242 BL#01 METHOD BLANK 01 CONC <100 <4 | <35 <35 **XREC** DUPL OID 60040240 10150235 55990242 55990239 902 BL#02 LCS 01 CONC 10300 868 XREC 103.0 87.1 90.5 DUPL OID 60040240 10150235 55990239 55990242 EXTERNAL OC 01 CONC 20500 N/A N/A 1 N/A %REC 91.1 DUPL 10150235 010 60040240 55990239 55990242 Total Organic Carbon TOC TVS Total Volatile Solids Oil and Grease Total Recoverable Petroleum Hydrocarbons TRPH

Jobfile Number: 90838
Project: GREEN BAY - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 17 AUG 00

•••	-		Analyte		% SDUPL	RPD	OID
90838	90838	100	O&G	88.5	87.4	1.3	55990239
90838	90838	104	TRPH	91.9	91.0	1.0	55990242

Page 1

END OF REPORT

	DESCRIPTION: GRE	EN BAY	- OLIN-ESTES		. JOB N	UMBER: 0054P0-92	2310183	RECEIPT DATE: 17
CHEM. P	RESERVATIVE:				TYPE OF S	AMPLE: WATER	COM	PLETION DATE: 26
	COLUMN		137	2 138	3 139	4 140	5 ¾	6
SAMP #		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	PCB-1018	PCB-1221	PCB-1232	PCB-1242	PC8-1248	PC8-1254
א יוואנ	DESCRIPTION							f-
90853	GREEN BAY 1400-1 8/10/00	CONC	<0.27 118.8	<0.27 	<0.27 	0,27	<0.27	<0.27
	OVERFLOW:	DUPL	54830238	54830238	54830238	   54830238	   54830238	   54830238
90854	GREEN BAY 1505-1 8/10/00 OVERFLOW	CONC XREC DUPL	<0.24	<b>≪0.24</b> 	<0.24	0.28	<0.24	<0.24
	3,217,204	OID	54830238	54830238	54830238	54830238	54830238_	   54830238
90855	GREEN BAY 1525 8/10/00 OVERFLOW	CONC XREC DUPL	<0.25	<0.25   	<0.25 	0.25 J	<0.25 	<0.25
		OID	54830238	54830238	54830238	54830238	54830238	54830238
¥0856	GREEN BAY 1625-1 8/10/00 OVERFLOW	CONC %REC	<0.24	<0.24 	<0.24	] 0.18 J	] <0.24	<0.24
			54830238	54830238	54830238	54830238	   54830238	54830238
90857	GREEN BAY 1715-1 8/10/00 OVERFLOW	CONC XREC	<0.25	<b>&lt;0.25</b>	<0.25	0.22 1	<0.25	<0.25
		OID	54830238	54830238	54830238	54830238	54830238	54830238
0858	GREEN BAY FEED 1400-1 8/10/00	CONC ZREC DUPL	<0.24	<0.24 	<0.24	0.29 	<0.24	<0.24
		010	54830238	54830238	54830238	54830238	54830238	54830238

		•			TON - DATA REPORT	ING SHEET ( PAG	E 2 DF 4 ) **	************	*****
CHEM.	B DESCRIPTION: GR PRESERVATIVE:	REEN BA	Y - OLIN-ESTES		JOB   TYPE OF !	NUMBER: 0054PD-9 SAMPLE: WATER		RECEIPT DATE: OMPLETION DATE:	17 AU 26 SE
	COLUMN ANALYTE. PPB			2 138 PCB-1221	3 139 PCB-1232	4 140 PCB-1242	5 741 PCB-1248	6 142 PCB-1254	
SAMP #	DESCRIPTION			•					
90859	GREEN BAY FEED 1505-1 8/10/00	CONI ZREI DUPI		<0.23 	<0.23	0.27	<0.23 	<0.23	1
		010		54830238	54830238	54830238	   54830238	   54830238	į
90860	GREEN BAY FEED 1525-1 8/10/00	CONC %REC		<0.20 	<0.20	0.27	<0.20	<0.20 	
	•	010	54830238	54830238	54830238	54830238	   54830238	54830238	į
90861	GREEN BAY FEED 1625-1 8/10/00	CONC KREC DUPL		<0.24	<0.24	0.36	<0.24	<0.24 	1
		010	54830238	54830238	54830238	54830238	54830238	54830238	İ
90862	GREEN BAY FEED 1715-1 8/10/00	CONC ZREC DUPL	<0.24	<0.24 	<0.24 	0.41	<0.24	<0.24 	!
		010	54830238	54830238	54830238	54830238	54830238	54830238	İ
BL#01	METHOD BLANK 01	CONC %REC DUPL	<0.25	<0.25	<0.25	<0.25 	<0.25	<0.25 	1
		010	54830238	54830238	54830238	54830238	   54830238	54830238	i
BL#02	LCS 01	CONC %REC DUPL		N/A 	H/A 	H/A	N/A 	N/A	'}   1
			54830238	54830238	54830238	54830238	54830238	54830238	i I
PC8-1232	PC8-1016 PC8-1232 PC8-1248				PCB-1221 PCB-1 PCB-1242 PCB-1 PCB-1254 PCB-1	1242			
						•			

			*		•						
JOB CHEM. P	DESCRIPTION: GRE RESERVATIVE:	YAS HE	- OLIN-ESTES	ţ		B NUMBER: F SAMPLE:	0054PD-92310183 WATER	RECEIPT COMPLETION	DATE:	17 # 26 !	Al Sí
	COLUMN		.7	.8	9			. <b>.</b> .			
	ANALYTE			145	146						
	PPB		PCB-1260	TCLXYL-S	DCLBP			•			
AMP #	DESCRIPTION							÷			
0853	GREEN BAY	CONC	<0.27	1 60.0%	66.9%	•					
	1400-1 8/10/00	%REC	= :	65.6	65.4	Į l					
	OVERFLOW	DUPL		1	/ 05.4 	<i>}</i>					
		010	54830238	54830238	54830238	ļ			,		
0854	GREEN BAY 1505-1 8/10/00	CONC ZREC	<0.24	<b>63.7%</b> ;  .	66.9%	Į.	·				
	OVERFLOW	OID	54830238	54830238	54830238	1		-			
0855	GREEN BAY	CONC	<0.25	62.8%	66.7%						
	1525 8/10/00 OVERFLOW	%REC DUPL	,		00.7%						
		OID	54830238	54830238	54830238	,					
856	GREEN BAY	CONC	<0.24	70.4%	1 70.0%						
	1625-1 8/10/00 OVERFLOW	XREC DUPL			1						
		OID	54830238	54830238	54830238						
					* #						
857	GREEN BAY		<0.25	65.8%	68.8%	ť					
	1715-1 8/10/00	XREC		Ĺ	i	į					
	DYERFLOW	DUPL	I	1	1	İ					
		OID	54830238	54830238	54830238	ı					
858	GREEN BAY FEED	COMP	-6 m	·						4	.1
	1400-1 8/10/00		<0.24	62.4%	69.6%	].					
	1400. 1 07 107 03	%REC DUPL		1	Į.	. !					
			54830238 I	   54830238	1 5/020020						
		<b>9.</b>	34030230	, 34030236	54830238	1					

### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COMPLETION DATE: 17 A COMPLETION DATE: 26 S COMPLETION DATE: 26 S COLUMN    ### COLUMN   TO   STATE    ### COLUMN   TO   STATE    ### COMPLETION DATE: 17 A COMPLETION DATE: 26 S COLUMN    ### COLUMN   TO   STATE    ### COMPLETION DATE: 17 A COMPLETION DATE: 26 S COLUMN    ### COMPLETION DATE: 17 A COMPLETION DATE: 26 S COLUMN    ### COMPLETION DATE: 17 A COMPLETION DATE: 26 S COLUMN    ### COMPLETION DATE: 17 A COMPLETION DATE: 26 S COLUMN    ### COLUMN DATE: 26 S COLUMN    ### COMPLETION DATE: 26 S COLUMN    ### COMPLETION DATE: 26 S COLUMN    ### COLUMN DATE: 26 S COLUMN    ### COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN DATE: 26 S COLUMN	uun F	14: 90853								DATE: 26 S
CHEN. PRESERVATIVE:  COLLINK	***	**************************************	***** ENV	I RONMENTAL	CHEMISTRY BRAN	CH - DATA REPO	RTING SHEE	T ( PAGE 4 OF	4 ) *********	****
COLUMN	CHEM.	PRESERVATIVE:	EEN BAY - (	OLIN-ESTES		. 100 17PE O	B NUMBER: F SAMPLE:	0054PD-92310183 WATER		DATE: 17 A
90859 GREEN BAY FEED CONC		COLUMN ANALYTE.	14		145	146			4	
1505-1 8/10/00	SAMP #	DESCRIPTION								
90860 GREEN BAY FEED CONC <0.20   65.0%   67.2%   1525-1 8/10/00 XREC DUPL OID 54830238   54830238   54830238   90861 GREEN BAY FEED CONC <0.24   81.4%   70.8%   1625-1 8/10/00 XREC DUPL OID 54830238   54830238   90862 GREEN BAY FEED CONC <0.24   77.2%   69.8%   1715-1 8/10/00 XREC DUPL OID 54830238   54830238    8L#01 METHOD BLANK 01 CONC <0.25   40.5%   62.0%   1715-1 8/10/00 XREC DUPL OID 54830238   54830238    8L#02 LCS 01 CONC <0.22   70.3%   67.8%   170.8%   70.8%   170.8	90859	GREEN BAY FEED 1505-1 8/10/00	XREC DUPL		İ	į	 	,		
1525-1 8/10/00			24.	370250	1 34030230	54830238	1			
90861 GREEN BAY FEED CONC <0.24   81.4%   70.8%   1625-1 8/10/00   XREC   DUPL   OID 54830238   548	90860		%REC	.20	65.0%	67.2x	 			
1625-1 8/10/00 XREC DUPL OID 54830238   5483			O1D 548	30238	54830238	54830238	i		-	
90862 GREEN BAY FEED CONC <0.24   77.2%   69.8%   1715-1 8/10/00 %REC   DUPL	90861		XREC DUPL		j 1	j ,	!			
1715-1 8/10/00			015 546	30238	54830238	54830238	I			
BL#01 METHOD BLANK 01 CONC <0.25	90862		%REC	24	77.2%	69.8% 	 			
### 1260 PCB-1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 ### 1260 #### 1260 #### 1260 #### 1260 #### 1260 ####################################			OID 548:	30238	54830238		j			
DID 54830238   5483023	BL#01	METHOD BLANK 01	%REC	?5	60.5%	62.0%	!			
PCB-1260 PCB-1260				50238	54830238	1   54830238	1			
OID 54830238   54830238   54830238   FOR 1260   FOR 126	BL#02	LCS 01	XREC 88.0		70.3% 	↓ 67.8%	[ 			•
				0238	54830238	54830238				
			nyl (Surroga	te (40-140	WS))	TolXYL-S 2,	4,5,6-Tetr	achloro-m-xylend	e(Surrogate(40-140	ws

Jobfile Number: 90853
Project: GREEN BAY - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 17 AUG 00

Job#	Sample	Tst	Analyte	% REC	% SDUPL	RPD	OID
90853 90853 90853	90853 90853 90853	137 143 145	PCB-1016 PCB-1260 TclXYL-S DCLBP	118.8	129.2 112.0 65.5 64.7	8.4 23.1 0.2 1.1	54830238 54830238 54830238 54830238

Page 1

END OF REPORT

	tion: GREEN BAY - OLIN-	ESTES	Job	File Number:	90853
		Assurance Corr		n Form 🤏	<u> </u>
Analysis: Analyst:	РСВ			26-Septembe	
Problem:	Instrument integrated	incorrectly because of k	ow responses or co	oncentrations,	
Sample N	lumber(s) Affected:	90853-90862		2	
Recomme	ended Corrective Action:	Re-integrate manually	,		
Corrective	e Action Taken By Analyst	: Same as above,			
Commen	ts: Re-integrated manua	ally and reported values,	If there are quest	ions, please call.	÷
	rective Action Taken:	26-September-00			

1/4	ΓΧ	*****	ENVIRONMENTAL	CHEMISTRY BRANC	CH - DATA REPORTE	NG SHEET ( PAGE	1 OF 4 > **	***************
JOB I	DESCRIPTION: GRE	EN BAY	- OLIN-ESTES			UMBER: 0054PD-9	Y	RECEIPT DATE: 21
	COLUMN			_		AMPLE: WATER		DMPLETION DATE: 26
	ANALYTE		137 PCB-1016	2 138 PCB-1221	3 139 PCB-1232	4 140 PCB-1242	5 141 PCB-1248	6 142 PCB-1254
SAMP #	DESCRIPTION							
90883	GREEN BAY 1400-2 8/10/00 OVERFLOW	CONC	<0.25	<0.25	{ <0.25	[ 0.13 J	<0.25	<b>&lt;</b> 0.25
	CASCALEGM	DUPL CID	54830255	54830255	   54830255	54830255	54830255	   54830255
90884	GREEN BAY 1505-2 8/10/00 OVERFLOW	CONC %REC DUPL	<0.24	<0.24 	<0.24 	1 0.12 J	<0.24 	<0.24
		OID	54830255	54830255	54830255	54830255	54830255 _	54830255
90885	GREEN BAY 1525-2 8/10/00 OVERLEON	CONC %REC	<0.25 88.4	<0.25	<0.25	0,15 ý	\ <0.25	<0.25
		010	54830255	54830255	i   54830255	54830255	   54830255	54830255
90886	GREEN BAY 1625-2 8/10/00 OVERFLOW	CONC %REC DUPL	×0.25	<0.25 	<0.25	0.21 4	<0.25	] <0,25 ]
		OID	54830255	54830255	54830255	54830255	54830255	54830255
90887	GREEN BAY 1715-2 8/10/00 OVERFLOW	CONC ZREC DUPL	<0.26	<0.26 	<0.26	0.24 J	<0.26 	<0.26   
			54830255	54830255	54830255	54830255	   54830255	54830255
90888	GREEN BAY FEED 1400-2 8/10/00	CONC %REC DUPL	<0.23	<0.23	<0.23 	[ 0.13 J	<0.23	<0.23
			54830255	54830255	54830255	54830255	54830255	54830255
PCB-1232	PCB-1016 PCB-1232				PCB-1221 PCB- PCB-1242 PCB	-1221 -1222		
PCB-1248	PCB-1248	,		÷	PCB-1254 PCB	-1254		

	DESCRIPTION: GR	EEN BAY	' • OLIN-ESTĘS			IUMBER: 0054PD-9		RECEIPT DATE:	21 AU
	COLUMN ANALYTE. PPB			2 138 PCB-1221	3 139 PC8-1232	4 140 PCB-1242	5 4	APLETION DATE:  6 142 PCB-1254	26 SEF
SAMP #	DESCRIPTION								
90889	GREEN BAY FEED 1505-2 8/10/00	CONC KREC DUPL	<0.24	<0.24 	<0.24	( 0.13 J	<0.24 	<0.24	
		010	54830255	54830255	54830255	54830255	54830255	54830255	i
90890	GREEN BAY FEED 1525-2 8/10/00	CONC %REC DUPL	<0.24	<0.24 	<0.24 	<0.24	<0.24	<0.24 	
		OID	54830255	54830255	54830255	54830255	54830255 <u></u>	54830255	1
90891	GREEN BAY FEED 1625-2 8/10/00	CONC %REC DUPL	<0.24	<0.26 	<0.26	0.21 J 	<0.26	<0.26	1
		<b>0</b> 1D	54830255	54830255	54830255	54830255	54830255	54830255	1
90892	GREEN BAY FEED 1715-2 8/10/00	CONC %REC DUPL	<0.24	<0.24 	<0.24 .	0.36	<0.24 	<0.24	<b> </b>
		OID	54830255	54830255	54830255	54830255	54830255	54830255	1
BL#01	METHOD BLANK 01	CONC ZREC DUPL	<0.25	<0.25	<0.25 	<0.25 	<0.25	<0.25	1
		OID	54830255	54830255	54830255	54830255	54830255	54830255	
BL#02	LCS 01	CONC XREC DUPL		N/A 	N/A 	N/A	H/A 	N/A	1 %
			54830255	54830255	54830255	54830255	54830255	\$4830255	l †
PCB-1232	PCB-1016 PCB-1232 PCB-1248				PCB-1221 PCB- PCB-1242 PCB- PCB-1254 PCB-	1242			
			•						

	JOB P ⊾M∃ĶO	DESCRIPTION: GR	EEN BAY	- OLIN-ESTES		BOL an agyt	NUMBER:	0054PD-92310183	RECEIPT	DATE:	21 AUG
		COLUMN		7	_		SAMPLE:	WATER	COMPLETION	DATE:	26 SEP
		ANALYTE.			-8 145	9 146			4.		
		PP8		PCB-1268	TolXYL-S	DCLBP			3		
9	SAMP #	DESCRIPTION							* •		
9	00883	GREEN BAY	CONC	<0.25	1 59.8%	1 da a			·		
		1400-2 8/10/00	XREC	10.23	37.0%	67.2%	1				
		OVERFLOW	DUPL		j	1	1		•		
			OID	54830255	54830255	54830255	i i	•			
				•			-				*
9	0884	GREEN BAY	CONC	<0.24	45.6%	1 64.1%	1				
		1505-2.8/10/00	XREC		1	1	Į į				
		OVERFLOW:	DUPL	5.22	1	j	i				
			OID	54830255	54830255	54830255	į		, <b></b> -		
9	0885	GREEN BAY		<0.25	54.3%	66.6%	J				
		1525-2 8/10/00		78.8	61.9	74.9	i				
		OVERLEON	DUPL	54830255	1 5/070252		j				
			010	J4030233	54830255	54830255	4				
_											
90	0886	GREEN BAY		<0.25	56.8%	63.6%	1				
		1625-2 8/10/00 OVERFLOW	XREC DUPL		4 4	!	Í				
		ara sari		54830255	   54830255	   54830255	i				
					,	4	ı				
90	887	GREEN BAY	CONG	~o: 54	t electrica						
		1715-2 8/10/00	CONC %REC	70.60	53.2%	61.2%	ļ				
		OVERFLOW	DUPL		ì	! 	1				
			010	54830255	54830255	54830255	i				
90	888	GREEN BAY FEED	CONC	<0.23	56.8%	67.4%	ı				1 1%
		1400-2 8/10/00	%REC				I I				,
			DUPL	Évinanië.≥=	ļ		i.				
			010	54830255	54830255	54830255	T.				
		·							•		
	B-1260					TCLXYL-S 2.	4,5,6-Tet	rachioro-m-xylene	(Surronate/An-iki	n tee	
uci	LBP	Decachlorobiphe	nyl(Sur	rogate (40-140	WS))	•	\$ 450 X 55		rear independent 130	, #3	

J03 / 11.5: 90883 DATE: 26 SEF JOB DESCRIPTION: GREEN BAY - OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 21 AUG CHEM. PRESERVATIVE: TYPE OF SAMPLE: WATER COMPLETION DATE: 26 SEP COLUMN..... 7 ANALYTE..... 143 145 146 PPB..... PCB-1260 TclXYL-\$ DCLBP SAMP # DESCRIPTION GREEN BAY FEED CONC <0.24 90889 1 29.8% 58.5% 1505-2 8/10/00 XREC DUPL OID 54830255 54830255 54830255 90890 GREEN BAY FEED CONC <0.24 1 38.5% 72.5% 1525-2 8/10/00 XREC DUPL 010 54830255 54830255 54830255 90891 GREEN BAY FEED CONC <0.26 35.1% 1 64.6% 1625-2 %REC 8/10/00 DUPL 010 54830255 54830255 54830255 90892 GREEN BAY FEED CONC <0.24 1 35.6% 1 64.3% 1715-2 8/10/00 XREC DUPL OID 54830255 54830255 54830255 METHOD BLANK D1 CONC <0.25 BL#01 64.1% XREC DUPL 010 54830255 54830255 54830255 BL#02 LCS 01  $t\in V_{\mu}^{\mu}$ CONC 2.32 70.8% 1 74.6% %REC 92.8 DUPL OID 54830255 54830255 54830255 PCB-1260 PCB-1260 TclXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(60-150 WS Decachlorobiphenyl(Surrogate (40-140 WS))

Jobfile Number: 90883

GREEN BAY - OLIN-ESTES

Project: GREEN BAY - OLIN Account Number: 0054PD-92310183 Date Received: 21 AUG 00

Job#	Sample	Tst	Analyte	% REC	% SDUPL	RPD	OID ,
90883 90883 90883	90885 90885 90885	137 143 145	PCB-1016 PCB-1260 TclXYL-S DCLBP	88.4 78.8	82.8 74.8 68.2 68.6	6.5 5.2 9.7 8.8	54830255 54830255 54830255 54830255

Page 1

END OF REPORT

		•	
Job Descrip	tion: GREEN BAY - OLIN-ESTES	Job	File Number: 90883
	,	nce Corrective Action	n Form
Analysis: Analyst:		Date:	26-September-00
Problem:	Instrument integrated incorrectly	because of low responses or or	oncentrations.
	00000 00		·
Sample N	Number(s) Affected: 90883-90		
Recomm	ended Corrective Action: Re-integr	rate manually	
			·
Correctiv	ve Action Taken By Analyst: Same as	s above.	
	,		
Commer	nts: Re-integrated manually and repo	orted values. If there are quest	tions, please call.
Date Co		ofember-00 Millan	
Reviews	1 1		
I	<i>' ' '</i>		

DATE: 13 MAR 0 JOB FILE: 90893 JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 21 AUG C JOB DESCRIPTION: GREEN BAY - OLIN-ESTES TYPE OF SAMPLE: WATER COMPLETION DATE: 13 MAR C CHEM. PRESERVATIVE: HNO3 COLUMN..... 1 8 ANALYTE..... 2 PB HG CR CU PPM..... AS CD RC SAMP # DESCRIPTION | <0.00020 0.003 <0.001 <0.0002 1 0.005 90899 GREEN BAY FEED CONC 0.004 1525-2 8/10/00 %REC DUPL 01260271 01260271 04650255 01260271 010 01260271 I 01260271 HGA AUTH HGA AUTH HGA AUTH HGA AUTH | <0.00020 I <0.001 90900 GREEN BAY FEED CONC 0.004 <0.0002 0.004 0.002 1625-1 8/10/00 %REC 04650255 01260271 01260271 01260271 01260271 GID 01260271 HGA AUTH HGA AUTH HGA AUTH HGA AUTH 0.003 <0.001 <0.00020 <0.0002 1 0.004 CONC 0.004 90901 GREEN BAY FEED 96.2 88.0 84.4 1625-2 8/10/00 %REC 126.2 93.0 92.6 I <0.00020 DUPL 0.004 <0.0002 0.004 0.003 <0.001 01260271 01260271 01260271 01260271 04650255 010 01260271 HGA AUTH HGA AUTH HGA AUTH HGA AUTH <0.00020 <0.001 0.004 1 0.002 90902 GREEN BAY FEED CONC 0.004 <0.0002 %REC 1715-1 8/10/00 DUPL 04650255 01260271 01260271 010 01260271 01260271 01260271 HGA AUTH HGA AUTH HGA AUTH HGA AUTH <0.0002 0.005 0.003 <0.001 <0.00020 GREEN BAY FEED CONC 0.004 90903 1715-2 8/10/00 XREC DUPL 01260271 01260271 01260271 01260271 04650255 010 01260271 HGA AUTH HGA AUTH HGA AUTH HGA AUTH <0.001 1 0.002 0.005 CONC 0.004 1 <0.0002 90904 GREEN BAY 1400-1 8/10/00 ZREC DUPL 01260271 01260271 04650255 010 01260271 01260271 01260271 HGA AUTH HGA AUTH HGA AUTH HGA AUTH CD Cadmium AS Arsenic Copper CR Chromium CU Mercury Lead PB

DATE: 13 MAR

JOB D	ESCRIPTION: GREE	N BAY	- OLIN-ESTES		Joi	3 NUMBER: 0054PD-	92310183	RECEIPT DATE:	21 AU
HEM. PR	ESERVATIVE: HNO	5			TYPE O	F SAMPLE: WATER	C	COMPLETION DATE:	13 MA
	COLUMN	منتب	j	2	3	4	5	6	
	ANALYTE		2	4	5	6	7	8	
	PPM		AS	CD	CR	ĊU	PB	ĤĠ	
AMP #	DESCRIPTION								
0905	GREEN BÂY	CONC	0.004	<0.0002	0.005	0.002	<0.001	<0.00020	Į
	1400-2 8/10/00	%REC		}		1	1	1	
	OVERFLOW	DUPL		]	1	Ì	1	1	-
		OLD	01260271	01260271	01260271	01260271	01260271	04650255	
				HGA AUTH	HGA AUTH	KTUA ADH	HGA AUTH		
70906	GREEN BAY	CONC	0.005	<0.0002	0.005	0.002	<0.001	<0.00020	1
	1505-1 8/10/00	XREC		1.		1	ļ	1	ļ
	OVERFLOW	DUPL		1		1			!
		010	01260271	01260271	01260271	01260271	01260271	04650255	1
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
0907	GREEN BAY	CONC	0.004	<0.0002	0.005	0.002	<0.001	<0.00020	ļ
	1505-2 8/10/00	ZREC		1	1	!	ļ	ļ	j
	OVERFLOW	DUPL	******		1 047/00-	1 04040774	1 01260271		<b>.</b>
		alo	01260271	01260271	01260271	01260271	01260271	04650255	ı
				HGA AUTH:	HGA AUTH	HGA AUTH	HGA AUTH		
20908	GREEN BAY	CONC	0.004	<0.0002	0.006	0.002	<0.001	<0.00020	1
	1525-1 8/10/00	XREC		1	Į	1	1	ļ	1
	OVERFLOW	DUPL		1	1	Į	Į	<u> </u>	Į
		010	01260271	01260271	01260271	01260271	01260271	04650255	ł
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
90909	GREEN BAY	CONC	0.003	<0.0002	0.005	0.002	<0.001	<0.00020	į
	1525-2 8/10/00	7REC	126.6	93.2	95.4	86.6	91.8	90.0	ļ
	OVERFLOW	DUPL	0.003	<0.0002	0.005	0.002	<0.001	<0.00020	- !
•		010	01260271	01260271	01260271	01260271	01260271	04650255	1
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
90910	GREEN BAY	CONC	0.004	<0.0002	0.006	0.003	<0.001	<0.00020	1
	1625-1 8/10/00	XREC		į.	!	ļ ļ		1	!
	OVERFLOW	DUPL		1	1 040/077	1 04340271	1 01740774	   04650255	1
		010	01260271	01260271 HGA AUTH	01260271 HGA AUTH	•	01260271 HGA AUTH	04030233	ı
			·		CD .	'Cadmitum	•		
AS	Arsenic				CD	Copper			
CR PB	Chromium Lead				HG	Mercury			

									•
	DESCRIPTION: GREE RESERVATIVE: HNO		- OLIN-ESTES		TYPE OF S	UMBER: 0054PD-92 AMPLE: WATER		RECEIPT DATE: OMPLETION DATE:	
	COLUMN		1	2	3	4	5	6	
	ANALYTE		2	4	5	6	7	8	
	PPM	•••••	AS	CD	CR	CU	PB	HG	
SAMP #	DESCRIPTION								
90911	GREEN BAY 1625-2 8/10/00 OVERFLOW	CONC XREC DUPL	0.005	<0.0002	0.007	0.802 	<0.001 	<0.00020   	
		010	01260271	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	04650255	i
20912	GREEN BAY 1715-1 8/10/00 OVERFLOW	CONC XREC DUPL	0.004	<0.0002   	0.006	0.002 	<0.001 	<0.00020   	
		DID	01260271	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	04650255	i
90913	GREEN BAY 1715-2 8/10/00 OVERFLOW	CONC %REC DUPL	0.004	<0.0002   	a.005   	0.002	<0.001   	<0.00020   	   
		OID	01260271	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	04650255	İ
L#01	METHOD BLANK 01	CONC %REC OUPL	<0.002	<0.0002   	<0.001 	<0.001 	<0.001 	<0.00020   	1
		010	01260271	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	101260271 HGA AUTH	04650255	i
L#02	LCS 01	CONC %REC DUPL	0.050 100.0	0.0518   103.6 	0.052	0.048   96.4 	0.050   100.6 	0.000765   102.0 	
		010	01260271	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	01260271 HGA AUTH	04650255	Ī
L#03	EXTERNAL QC 01	<b>X</b> REC	0.428 310.3	0.174	0.522	99.5	0.619	0.000624   104.5	1
		DUPL	01260271	01260271 HGA AUTH	01260271 HGA AUTH	}   01260271   HGA AUTH	   01260271   HGA AUTH	   04650255	i
s	Arsenic					imi um			
R	Chromium				CU Cop	per			

****	FNVIRONMENTAL	CHEMISTRY	BRANCH	- DATA	REPORTING	SHEET	:(	PAGE	5	OF	12	<b>)</b> *	rww

: C#1		ESCRIPTION: GREEN	N BAY -	OLIN-ESTES		JOB TYPE OF	NUMBER: SAMPLE:	0054PD-92 WATER	310183	RECEIPT DATE: COMPLETION DATE:	100
· • • • • • • • • • • • • • • • • • • •	Liste 1 Ky			· 	8	9	11	n.	1.1	12	
		COLUMN			=	11	1		25	30	
		ANALYTE			10	AG	2		BA"	FE	
		РРМ		NI	SE	Λū		•			
SAI	MP #	DESCRIPTION									R
on:	893	GREEN BAY	CONC	0.014	0.002	<0.001	0	.046	0.108	0.080	Ţ
• -		SUPPLY WATER	XREC	83.6	131.0	81.8	] 8	3.0	94.4	8.8	ļ
		8/10/00 0930	DUPL	0.014	0.002	<0.001	0	.045	0.107	0.077	ļ
		<b>5, (4, 55 5.25</b>	010	01260271	01260271	01260271	10	1260271	01260271	01260271	l
			•••	HGA AUTH	•	HGA AUTH				•	
90	894	GREEN BAY FEED 1400-1 8/10/00	%REC	0.009	0.002	<0.001	<b> </b>	.095	0.302	0.047	
			DUPL			04740374		(3 <u>2</u> 0271	01230269	01260271	i
			OID	01260271	01260271	01260271	1 4	11260271	1.0123020	, , , , , , , , , , , , , , , , , , , ,	. '
				HGA AUTH		HGA AUTH					
or	0895	GREEN BAY FEED	CONC	0.010	0.002	<0.001	] (	.071	0.264	0.083	<u>ļ</u>
		1400-2 8/10/00	XREC		i	Ì	1		1	ļ	!
			DUPL		i	Ì	· :1				ļ.
			OID	01260271	01260271	01260271	10	11260271	0123026	9   01260271	Ĺ
				HGA AUTH		HGA AUTH					
io r	0896	GREEN BAY FEED	CONC	0.009	0.002	<0.001	] (	3.042	0.183	0.073	1.
2)	9070	1505-1 8/10/00	ZREC		i	Ì	- 1		l	Į	ļ
		1202 / 07 10/00	DUPL		j	i	1		ļ	1	ļ
			OID	01260271	01260271	01260271	j i	01260271	0123026	9   01260271	1
			010	HGA AUTH	1 -	HGA AUTH	•				
					1 0.002	I <0.001	1	0.050	1 0.205	0.407	1
9	0897	GREEN BAY FEED		0.010	0.002	1 50.001			1	i	i
		1505-2 8/10/00	ZREC		-	, ¦	- }		i	-i	i
			DUPL		1 010/0271	01260271	1	01260271	0123026	9   01260271	i
			.010	01260271	01260271	HGA AUTH	1	0120021	1		•
				HGA AUTH		MGA NUIN					2
۰	20898	GREEN BAY FEED	CONC	0.010	0.002	<0.001	-	0.045	0.194	0.055	!
- 5		1525-2 8/10/00	%REC		İ		1		İ		!
		, ,,,,,,,	DUPL		į.	1	1		ļ,		
			OID	01260271	01260271	01260271	-	01260271	0123026	9 01260271	. I.
				HGA AUTH	• • • • •	HGA AUTH			•		
		Nickel				SE	Seleniu	ım			
	N!	Silver			9	ZN	Zinc				
	AG					FE	Iron				
	BA	Barium									

DATE: 13 MAR ( JOB FILE: 90893 JOS NUMBER: 0054PD-92310183 RECEIPT DATE: 21 AUG ( JOB DESCRIPTION: GREEN BAY - OLIN-ESTES TYPE OF SAMPLE: WATER COMPLETION DATE: 13 MAR ( CHEM. PRESERVATIVE: HNO3 12 10 11 COLUMN...... 7 25 30 11 13 ANALYTE..... 9 10 FE ZN BA PPM..... NI DESCRIPTION SAMP # 0.038 0.168 0.425 GREEN BAY FEED CONC 0.010 0.002 <0.001 90899 1525-2 8/10/00 XREC DUPL 01260271 01230269 01260271 1 01260271 QID 01260271 01260271 HGA AUTH **HGA AUTH** 0.127 GREEN BAY FEED CONC 0.009 0.002 <0.001 1 0.022 0.021 90900 1625-1 8/10/00 %REC DUPL 01260271 01260271 01260271 01230269 01260271 01260271 OID HGA AUTH <0.020 0.111 1 0.019 GREEN BAY FEED CONC 0.009 0.002 <0.001 90901 116.0 131.4 84.6 82.4 96.8 %REC 86.4 1625-2 8/10/00 <0.001 0.018 0.110 <0.0020 0.002 DUPL 0.009 01230269 01260271 01260271 010 01260271 01260271 01260271 HGA AUTH HGA AUTH 1 0.032 1 0.002 <0.001 0.024 0.141 GREEN BAY FEED CONC 0.010 90902 1715-1 8/10/00 **XREC** DUPL. 01230269 01260271 01260271 010 01260271 01260271 01260271 HGA AUTH HGA AUTH <0.001 0.022 0.133 0.033 0.002 CONC 0.010 90903 GREEN BAY FEED 1715-2 8/10/00 **XREC** DUPL 01260271 01260271 01230269 01260271 010 01260271 01260271 HGA AUTH HGA AUTH 0.111 1 0.246 0.062 CONC 0.009 0.002 <0.001 90904 GREEN BAY 1400-1 8/10/00 **XREC** OVERLEOW DUPL 01260271 01260271 01260271 01230269 010 01260271 01260271 HGA AUTH HGA AUTH Selenium SE NI Nickel ZN Zinc Silver AG FE Iron

	DESCRIPTION: GREE RESERVATIVE: HNO		- OLIN-ESTES	**	TYPE OF S		-92310183	RECEIPT DATE: COMPLETION DATE:	21 AUG 13 MAR
	COLUMN		<b>7</b>	8	9:	10	11	12	
	ANALYTE		9	10	11	13	25	30	
	PPM		NI	SE	AG	ZN	BA.	FE:	
SAMP #	DESCRIPTION				•				
90905	GREEN BAY 1400-2 8/10/00 OVERFLOW	CONC XREC DUPL	0.008	0.002   	<0.001	0.077   	0.263   	0.053   	
		010	01260271 HGA AUTH	01260271	01260271 HGA AUTH	01260271	01230269	01260271	1
90906	GREEN BAY 1505-1 8/10/00 OVERFLOW	CONC %REC DUPL	0.009	0.002	( <0.001	0.041	0.180   	0.024	
		OID	01260271 HGA AUTH	01260271	01260271 HGA AUTH	01260271	01230269	01260271	İ
90907	GREEN BAY 1505-2 8/10/00 OVERFLOW	CONC TREC DUPL	0.009	0.002   	<0.001   	0.046 	0.197   	0.153   	
-		OID	01260271 HGA AUTH	01260271	01260271 HGA AUTH	01260271	j 01230269	01260271	ĺ
90908	GREEN BAY 1525-1 8/10/00 OVERFLOW	CONC XREC DUPL	0.010	0.002   	<0.001   	0.047   	0.186	0.034   	   
		OID	01260271 HGA AUTH	01260271	01260271   HGA AUTH	01260271	01230269	01260271	Ì
90909	GREEN BAY	CONC	0.009	0.002	<0.001	0.042	0, 193	0.130	1
	1525-2 8/10/00	%R EC	88.8	129.2	8.2	81.2	96.4	98.8	İ
	OVERFLOW	DUPL	0.009	0.002	<0.001	0.043	0.193	0.135	- 1
		OID	01260271 HGA AUTH	01260271	01260271 HGA AUTH	01260271	01230269	01260271	l
90910	GREEN BAY 1625-1 8/10/00 OVERFLOW	CONC XREC DUPL	ó.o1o	0.002	<0.001	0.021   	0.121	] 0.033   	
		OID	01260271 HGA AUTH	01260271	1 01260271 HGA AUTH	01260271	01230269	01260271	
NI	Nickel					lenium			
AG	Silver					ne			
BA	Barium				fé Ir	on			

DATE: 13 MAR ( JOB FILE: 90893 RECEIPT DATE: 21 AUG ( . JOB NUMBER: 0054PD-92310183 JOB DESCRIPTION: GREEN BAY - OLIN-ESTES COMPLETION DATE: 13 MAR ( CHEM. PRESERVATIVE: HNO3 TYPE OF SAMPLE: WATER COLUMN...... 13 15 ANALYTE..... 31 33 32 PPM..... MG MO R. SAMP # DESCRIPTION 1.97 0.002 GREEN BAY FEED CONC 77.9 1525-2 8/10/00 %REC DUPL 01230269 01260271 010 01230269 90900 GREEN BAY FEED CONC 77.3 1.59 0.003 1625-1 8/10/00 %REC OID 01230269 01230269 01260271 1 0.003 90901 GREEN BAY FEED CONC 77.3 1 1.30 1625-2 8/10/00 %REC 94.4 96.2 108.0 DUPL 76.9 1.29 0.003 01260271 01230269 OID 01230269 90902 GREEN BAY FEED CONC 76.7 1.41 0.002 1715-1 8/10/00 %REC DUPL 010 01230269 01230269 01260271 90903 GREEN BAY FEED CONC 78.0 1.46 1715-2 8/10/00 %REC DUPL 010 01230269 01230269 01260271 1 0.005 CONC 78.6 1 1.72 90904 GREEN BAY 1400-1 8/10/00 %REC DUPL OVERLFOW DID 01230269 01230269 01260271 Manganese Magnesium MG MO Molybdenum

****	*****	*** E	NVIRONMENTAL C	HEMISIRT BRANCH -	· DATA KEPU	CITAG SHEE	T CPAGE 12 OF	12 ) *********	-
	ESCRIPTION: GREEN HNO3		- OLIN-ESTES			NUMBER:	0054PD-92310183 WATER	RECEIPT COMPLETION	
	COLUMN		13	14	15				
	ANALYTE		31	32	33				
	PPM		MG	MN	MO				
SAMP #	DESCRIPTION								
90911	GREEN BAY	CONC	77.6	1.63	0.003	1			
,,,,,	1625-2 8/10/00	XREC	•-	1	i	i			
	OVERFLOW	DUPL		İ	ļ	ļ			
		OID	01230269	01230269	01260271	١			
90912	GREEN BAY	CONC	76.7	1.31	0.003	1			
·	1715-1 8/10/00	XREC		1	!	!			
	OVERFLOW	DUPL	*******	1 012702/0	01260271	-			
		010	01230269	01230269	1 0.200271	'			
90913	GREEN BAY	CONC	77.9	1.38	0.003	1			
,,,,	1715-2 8/10/00	%REC		i	i	İ			
	OVERFLOW	DUPL		Ţ	1	!			
		DIO	01230269	01230269	01260271				
BL#01	METHOD BLANK 01	CONC	<0.100	<0.001	<0.001	1			
		<b>XREC</b>		ļ		ļ			
		DUPL	04270260	   01230269	01260271	1			
		010	01230269	1 41230209	1 0120027	1			
BL#02	LCS 01	CONG	4.70	0.480	0.051	1			
BLWVZ	203 01		94.0	96.0	102.2	j			
		DUPL		ļ	1	ļ			
		CID	01230269	01230269	01260271	ļ			
BL#03	EXTERNAL QC 01	CONC	34.6	0.566	0.568	ı			
			98.3	99.1	103.6	ļ			
		DUPL	040700/0	1 01270260	0126027	!			
		010	01230269	01230269	012002/	1			
MG	Magnesium				MN	Hanganes	e		
МО	Molybdenum								

.for of	SCRIPTION: GREE	N BAY	- OLIN-ESTES		* JOB NU	MBER: 0054PD-923	310183	RECEIPT DATE:	21 AUG
	SERVATIVE:			*.	TYPE OF SA	MPLE: SEDIMENT	COM	PLETION DATE:	3 OCT
	COLUMN ANALYTE UG/KG			2 138 PC8-1221	3 139 PCB-1232	4 140 PCB-1242	5 141 PCB-1248	6 142 PCB-1254	
SAMP #	DESCRIPTION								į
90914	GREEN BAY 1400-1 8/10/00 OVERFLOW		<18.0 99.6	<18.0 	<18.0   	3824 Z   	<18.0 	<18.0   	1
		OID	54830255	54830255	54830255	54830255	54830255	54830255	ı
90915	GREEN BAY 1505-1 8/10/00	CONC XREC	<20.3	<20.3	<20.3 	4376	<20.3	<20.3	ļ
	OVERFLOW	OID	54830255	54830255	54830255	54830255	54830255	54830255	1.
90916	GREEN BAY 1525-1 8/10/00	CONC	<18.0	<18.0 	∱ <18.0 	] 3859. 	<18.0 	] <18.0 	1
	OVERFLOW	OID	54830255	54830255	54830255	54830255	54830255	54830255	į
90917	GREEN BAY 1625-1 8/10/00	CONC XREC DUPL	<22.9	( <22.9 	<22.9	4719 ×	<22.9 	<22.9	
	OVERFLOW	010	54830255	54830255	54830255	54830255	54830255	54830255	ĺ
90918	GREEN BAY 1715-1 8/10/00	CONC	<20.6	<20.6	<20.6 	4482	<20.6  -	<20.6	}   
	OVERFLOW:	DUPL	54830255	54830255	54830255	54830255	54830255	54830255	į
90919	GREEN BAY 1400-2 8/10/00	CONC		<19.0	( <b>₹19.</b> 0	3823 /	<19.0 	<19.0   	     
	OVERFLOW	OID	54830255	   54830255	54830255	54830255	54830255	54830255	İ
PCB-123	6 PCB-1016 2 PCB-1232 8 PCB-1248			*	PCB-1221 PC PCB-1242 PC PCB-1254 PC	B-1242			

DATE: 03 OCT ( F JOB FILE: 90914 RECEIPT DATE: 3 OCT ( RECEIPT DATE: 21 AUG ( JOB NUMBER: 0054PD-92310183 JOB DESCRIPTION: GREEN BAY - OLIN-ESTES CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT 5 3 4 COLUMN...... 1 ANALYTE..... 137 139 140 141 142 138 PCB-1242 PCB-1232 PCB-1248 PCB-1254 UG/KG..... PCB-1016 PCB-1221 SAMP # DESCRIPTION 4659 / <20.4 <20.4 <20.4 90920 GREEN BAY CONC <20.4 <20.4 1505-2 8/10/00 %REC OVERFLOW DUPL 54830255 54830255 54830255 54830255 54830255 01D 54830255 3256 <16.7 <16.7 CONC <16.7 <16.7 <16.7 90921 GREEN BAY 1525-2 8/10/00 %REC OVERFLOW DUP1. 54830255 54830255 54830255 54830255 OID 54830255 54830255 | 4243 / <21.5 <21.5 I <21.5 <21.5 CONC <21.5 90922 GREEN BAY 1625-2 8/10/00 XREC OVERFLOW DUPL. OID 54830255 54830255 54830255 54830255 54830255 1 3138 / 1 <16.1 <16.1 1 <16.1 GREEN BAY CONC <16.1 | <16.1 1715-2 8/10/00 %REC OVERFLOW DUPL 54830255 54830255 54830255 54830255 010 54830255 54830255 | <18.4 <18.4 GREEN BAY FEED CONC <18.4 <18.4 3446 90924 1400-1 8/10/00 ZREC 54830255 54830255 54830255 54830255 54830255 O(D 54830255 <15.5 2933 <15.5 GREEN BAY FEED CONC <15.5 <15.5 <15.5 90925 1505-2 8/10/00 %REC DUPL 54830255 54830255 54830255 010 54830255 54830255 54830255 PCB-1221 PCB-1221 PCB-1016 PCB-1016 PCB-1242 PCB-1242 PCB-1232 PCB-1232 PCB-1254 PCB-1254 PCB-1248 PCB-1248

JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 21 AUG C JOB DESCRIPTION: GREEN BAY - OLIN-ESTES COMPLETION DATE: 3 OCT C TYPE OF SAMPLE: SEDIMENT CHEM. PRESERVATIVE: -6 COLUMN...... 1 141 142 139 140 ÄNALYTE..... 137 138 PC8-1248 PCB-1254 PCB-1242 PCB-1221 PC8-1232 UG/KG..... PCB-1016 SAMP # DESCRIPTION <15.9 <15.9 3216 GREEN BAY FEED CONC <15.9 <15.9 <15.9 90926 1525-2 8/10/00 ZREC DUPL 54830255 54830255 54830255 54830255 54830255 OID 54830255 <16.1 <16.1 2896 <15.1 1 <16.1 GREEN BAY FEED CONC <16.1 90927 1625-2 8/10/00 %REC 54830255 54830255 54830255 OID 54830255 54830255 54830255 Ì <15.8 <15.8 <15.8 | <15.8 2869 GREEN BAY FEED CONC <15.8 90928 1715-2 8/10/00 XREC DUPL 54830255 54830255 54830255 54830255 OID 54830255 54830255 <6.25 ₹6.25 <6.25 <6.25 <6.25 METHOD BLANK 01 CONC <6.25 XREC DUPL 54830255 54830255 54830255 54830255 54830255 OID N/A N/A N/A N/A N/A CONC 0.62 BL#02 LCS 01 %REC 98.8

PC8-1016 PCB-1016 PCB-1232 PCB-1232 PCB-1248 PCB-1248 DUPL

010 54830255

PCB-1221 PCB-1221 PCB-1242 PCB-1242

54830255

54830255

54830255

PCB-1254 PCB-1254

	ESCRIPTION: GREE	N BAY	- OLIN-ESTES		JOB NUMBE	R: 0054PD-92310183 E: SEDIMENT	RECEIPT DATE: 21 AU COMPLETION DATE: 3 OC
GALA, FA	COLUMN		7	8	9		
	ANALYTE		143	145 Tolxyl-S	146 DCLBP		
SAMP #	DESCRIPTION						
90914	GREEN BAY 1400-1 8/10/00 OVERFLOW	CONC %REC DUPL	123 109.2	107%   126 	185%     149		
		OID	54830255	54830255	54830255		
90915	GREEN BAY 1505-1 8/10/00 OVERFLOW	CONC %REC DUPL	119	93.0%	150% 		
	Office for		54830255	54830255	54830255		
90916	GREEN BAY 1525-1 8/10/00 OVERFLOW	CONC %REC DUPL	113	106% 	130%   		
	OVER! CON		54830255	54830255	54830255	i	
90917	GREEN BAY 1625-1 8/10/00 OVERFLOW	CONC %REC DUPL	64.1	106% 	112% 	 	
	GYERFEOR		54830255	54830255	54830255		
90918	GREEN BAY 1715-1. 8/10/00	CONC %REC DUPL	106	98.3%	116% 	] 	
	OVERFLOW		54830255	54830255	54830255		
90919	GREEN BAY 1400-2 8/10/00	CONC %REC	92.9	1112	126%	 	
	OVERFLOW	OIO	54830255	   54830255	54830255	1 	
PCB-126 DCLBP	0 PCB-1260 Decachlorobíph	enyl(S	urrogate (60-	150 WS))	TclXYL-S 2,4,5	,6-Tetrachloro-m-xylen	e(Surrogate(40-140 WS

COLUMN		ESCRIPTION: GREE	N BAY	- OLIN-ESTES		JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 21 AUG TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 3 OCT
ANALYTE				7.	8.	
90920 GREEN BAY CONC 113   112X   121X   1505-2 8/10/00   XREC		ANALYTE		143		·
1505-2 8/10/00   XREC   DUPL   OID   54830255   54830	SAMP #	DESCRIPTION				
010 54830255   54830255   54830255    90921 GREEN BAY CONC 158   106x   125x   1525-2 B/10/00 XREC       01D 54830255   54830255    90922 GREEN BAY CONC 103   110x   122x   1625-2 B/10/00 XREC     01D 54830255   54830255    90923 GREEN BAY CONC 107   107x   139x   1715-2 B/10/00 XREC     01D 54830255   54830255    90924 GREEN BAY FEED CONC 90.6   105x   122x   1400-1 B/10/00 XREC   01D 54830255   54830255    90924 GREEN BAY FEED CONC 90.6   105x   122x   01D 54830255   54830255    90925 GREEN BAY FEED CONC 90.6   105x   122x   01D 54830255   54830255    90925 GREEN BAY FEED CONC 116   102x   104x   010 54830255   54830255   54830255	90920	1505-2 8/10/00	XREC	113	112% 	121x
1525-2 8/10/00 XREC OVERFLOW  DUPL OID 54830255   54830255   54830255    90922 GREEN BAY CONC 103   110%   122%    1625-2 8/10/00 XREC    CVERFLOW DUPL OID 54830255   54830255   54830255    90923 GREEN BAY CONC 107   107%   139%    1715-2 8/10/00 XREC    OVERFLOW DUPL OID 54830255   54830255   54830255    90924 GREEN BAY FEED CONC 90.6   105%   122%    1400-1 8/10/00 XREC    DUPL    OID 54830255   54830255   54830255    90925 GREEN BAY FEED CONC 90.6   105%   122%    90926 GREEN BAY FEED CONC 90.6   105%   105%    90927 GREEN BAY FEED CONC 90.6   105%   105%    90928 GREEN BAY FEED CONC 90.6   105%   105%    90929 GREEN BAY FEED CONC 90.6   105%   105%    90920 GREEN BAY FEED CONC 116   102%   104%    90925 GREEN BAY FEED CONC 116   102%   104%    90925 GREEN BAY FEED CONC 116   102%   104%    90926 GREEN BAY FEED CONC 116   102%   104%    90927 GREEN BAY FEED CONC 116   102%   104%    90928 GREEN BAY FEED CONC 116   102%   104%    90929 GREEN BAY FEED CONC 116   102%   104%    90920 GREEN BAY FEED CONC 116   102%   104%    90921 GREEN BAY FEED CONC 116   102%   104%    90925 GREEN BAY FEED CONC 116   102%   104%    90926 GREEN BAY FEED CONC 116   102%   104%    90927 GREEN BAY FEED CONC 116   102%   104%    90928 GREEN BAY FEED CONC 116   102%   104%    90929 GREEN BAY FEED CONC 116   102%   104%    90929 GREEN BAY FEED CONC 116   102%   104%    90929 GREEN BAY FEED CONC 116   102%   104%    90929 GREEN BAY FEED CONC 116   102%   104%    90929 GREEN BAY FEED CONC 116   102%   104%    90929 GREEN BAY FEED CONC 116   102%   104%    90920 GREEN BAY FEED CONC 116   102%   104%    90920 GREEN BAY FEED CONC 116   102%   104%    90921 GREEN BAY FEED CONC 116   102%   104%    90922 GREEN BAY FEED CONC 116   102%   104%    90923 GREEN BAY FEED CONC 116   104%   104%    90924 GREEN BAY FEED CONC 116   104%   104%    90925 GREEN BAY FEED CONC 116   104%   104%    90926 GREEN BAY FEED CONC 116   104%   104%   104%    90927 GREEN BAY FEED CONC 116   104%   104%   104%   104%    90928 GREEN BAY FEED CONC 116   104%   104%				54830255	54830255	54830255
OVERFLOW  OID  OID  54830255    54830255	90921			158	106X	125%
1625-2 8/10/00 XREC DUPL  OTERFLOW D			CID	54830255	54830255	   54830255
01D 54830255   54830255   54830255    90923 GREEN BAY	90922	1625-2 8/10/00	%REC	103	110%	122%
1715-2 8/10/00		OVERFLOW	2.0	54830255	54830255	54830255
90924 GREEN BAY FEED CONC 90.6   105%   122%   1400-1 8/10/00 %REC	90923	1715-2 8/10/00	ZREC	107	107%	139%
1400-1 8/10/00 XREC DUPL OID 54830255 5480025 54800000000000000000000000000000000000		OVERPLOW		54830255	54830255	54830255
OID 54830255   5480255   5480255   5480255   5480255   5480255   5480255   5480255   5480255   5480255   54802	90924		XREC	90.6	105% 	) 122%
1505-2 8/10/00 XREC		,		54830255	54830255	54830255
01D 54830255   54830255   54830255	90925		%REC		102%	104%
			,		54830255	54830255
						•

DATE: 03 OCT ( JOB FILE: .90914 JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 21 AUG ( JOB DESCRIPTION: GREEN BAY - OLIN-ESTES COMPLETION DATE: 3 OCT ( TYPE OF SAMPLE: SEDIMENT CHEM. PRESERVATIVE: COLUMN..... 7 145 146 ANALYTE..... 143 UG/KG..... PCB-1260 TclXYL-S DCLBP SAMP # DESCRIPTION 120% GREEN BAY FEED CONC 113 116% 90926 1525-2 8/10/00 XREC DUPL 54830255 54830255 54830255 OID 120% 90927 GREEN BAY FEED CONC 138 110% 1625-2 8/10/00 %REC DUPL 010 54830255 54830255 54830255 97.8% 109% GREEN BAY FEED CONC 103 90928 XREC 1715-2 8/10/00 DUPL 54830255 54830255 010 54830255 METHOD BLANK 01 CONC <6.25 86.3% 74.2% BL#01 %REC DUPL 54830255 DID 54830255 54830255 72.3% CONC 0.61 87.2% LCS 01 %REC 97.2 DUPL 54830255 OID 54830255 54830255 TolXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(40-140 WS PCB-1260 PCB-1260 Decachlorobiphenyl(Surrogate (60-150 WS))

Jobfile Number: 90914

Project: GREEN BAY - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 21 AUG 00

		Tst Analyte		% SDUPL	RPD	OID SECOND
90914 90914 90914	90914 90914	137 PCB-1016 143 PCB-1260 145 TclXYL-S 146 DCLBP	99.6 109.2	44.8 115.6 119 154	75.9 5.7 5.7 3.3	54830255 54830255 54830255 54830255

Page 1

END OF REPORT

11 A	3	N DAY .	- OLIN-ESTES	•	. JOB N	UMBER: 0054PD-9Z	310183	RECEIPT DATE:	21 AU
7 \ \	DESCRIPTION: GREE RESERVATIVE:	N BAT	- OCIM-E21E2			AMPLE: SEDIMENT		MPLETION DATE:	
	COLUMN		1	2	3	4	5	6	
	ANALYTE			4	5 CR	6 CU	7 PB	8 HG	
	MG/KG	••••	AS	CD	LK	00			
SAMP #	DESCRIPTION								
90929	GREEN BAY	CONC	3.30	0.820	42.3	50.9	57.0	1.20	1
	1400-1 8/10/00	XR EC	93.8	95.6	98.6	89.0	102.4	96.0	ļ
	OVERFLOW	DUPL	3.20	0.800	41.6	50.3	56.1	1.18	!
		QIO	01260270	01260270 HGA AUTH	01260270 HGA AUTH	01260270 HGA AUTH	01260270 HGA AUTH	04650263	ı
				HOW WOLL	IIIA AOIA	(ICA ACA			
90930	GREEN BAY		3.89	0.869	53.7	56.0	64.0	1.51	
	1505-1 8/10/00	%REC		1	i I		ì	i	i
	OVERFLOW	DUPL OID	01260270	01260270	01260270	01260270	01260270	04650263	i
		0.0	01200210	HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
90931	GREEN BAY	CONC	2.69	0.648	37.5	49.7	48.6	1.22	1
70731	1525-1 8/10/00	%REC		İ	j	İ	1	ļ	!
	OVERFLOW	DUPL		İ	1	Į.			!
		OID	01260270	01260270 HGA AUTH	01260270   HGA AUTH	01260270 HGA AUTH	01260270 HGA AUTH	04650263	ı
							1 40 3	1.44	ı
90932	GREEN BAY		3.70	0.960	57.6	52.5	69.2	1 1.44	i
	1625-1 8/10/00	#REC DUPL		1	1	i	i	i	ĺ
	OVERFLOW	010	01260270	01260270	01260270	01260270	01260270	04650263	İ
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
90933	GREEN BAY	CONC	3.50	0.840	52.9	50.5	61.4	1.21	1
,0,55	1715-1 8/10/00	%REC		į	İ	İ	ļ	ļ	ļ
	OVERFLOW	DUPL		Ì	1	<u> </u>		1 04/503/7	- !
		OID	01260270	01260270	01260270	01260270	01260270	04650263	1
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
90934	GREN BAY	CONC	4.00	0.840	49.5	53.4	61.4	1.36	!
	1400-2 8/10/00	XREC		!	ļ	}	Ī	1	1
	OVERFLOW	DUPL		012/0270	01260270	i   01260270	01260270	04650263	i
		010	01260270	01260270 HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	1	•
	******				CD C	admium			
AS CR	Arsenic Chromium					оррег			
PB	Lead					lercury			
		•							

JOB FILE: 90929

DATE: 14 MAR I

	DESCRIPTION: GRE RESERVATIVE:	EN BAY	- OLIN-ESTES			NUMBER: 0054PD-9 SAMPLE: SEDIMENT		RECEIPT DATE: OMPLETION DATE:	
	COLUMN		1.	2	3	4.	5	6	
	ANALYTE		2	4	5	6	7	8	
	MG/KG			CD	CR	CU:	PB	HG	
AMP #	DESCRIPTION								
0935	GREEN BAY	CONC	3.50	0.879	48.2	53.7	64.6	1.52	1
	1505-2 8/10/00	%REC		i	1	]	-1	.j	ĺ
	OVERFLOW	DUPL		İ	Í	ĺ	İ	j	i
		OID	01260270	01260270	01260270	01260270	01260270	04650263	I
				HGA AUTH	HGA - AUTH	HTUA ADH	HGA AUTH		
0936	GREEN BAY	CONC	3.09	0.727	42.8	42.6	54.3	1.30	1
	1525-2 8/10/00	XREC		1	.1	1	Ţ	1	1
	OVERFLOW	DUPL		1	ļ	1		į.	Į
		OID	01260270	01260270	01260270	01260270	01260270	04650263	[
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	•	
937	GREEN BAY	100	3.89	0.937	59.3	52.4	67.0	1,,31	1
	1625-2 8/10/00	%REC	90.8	93.8	92.8	83.6	96.0	102.7	ļ
	OVERFLOW	DUPL	3.89	0.937	59.0	52.5	67.8	1.33	ļ
		OID	01260270	01260270   HGA AUTH	01260270   HGA AUTH	01260270 HGA AUTH	01260270 HGA AUTH	04650263	ļ
		20110	2.89	0.688	1 43.7	1 38.3	1 48.4	1 0.870	
0938	GREEN BAY	-	2.69	0.000	43.7	1 30.3	1 40.4	1 0.010	
	1715-2 8/10/00	%REC				ļ	- {	1	
	OVERFLOW	OUPL	01740770	01260270	01260270	01260270	   01260270	04650263	-
		QID	01260270	HGA AUTH	HGA: AUTH	HGA AUTH	HGA AUTH	Linionican	1
				NUM AUIN	nuA AUIR	DON AUTH	HEA AUTH		
0939	GREEN BAY FEED	CONC	3.29	] 0.738	44.3	46.5	50.8	1-11	1
	1400-2 8/10/00	%REC		I	1 .	1	Į	1	- 1
		DUPL		1	1	ļ		1	ļ
+		OID	01260270	01260270	01260270	01260270	01260270	04650263	,I,
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
0940	GREEN BAY FEED	CONC	2.70	0.580	37.7	38.2	41.6	1.00	- 1
	1505-2 8/10/00	<b>XREC</b>		1		<u> </u>	1	Ţ	ļ
		DUPL		ļ	1		1	1	Ţ
		010	01260270	01260270	01260270	01260270	01260270	04650263	I.
				HGA AUTH	HGA AUTH	HGA AUTH	HTUA ADH		
S	Arsenic					Cadmium			
R	Chromium				cu (	Copper			
3	Lead				HG 8	tercury			

	ESCRIPTION: GREE ESERVATIVE:	N BAY	- OLIN-ESTES			MBER: 0054PD-92 AMPLE: SEDIMENT		RECEIPT DATE: 21 AMPLETION DATE: 14 M
	COLUMN		1	2	3	4	5	6
	ANALYTE		2	4	5	6	7	8
	MG/KG	• • • • •	AS	CD	CR	CU	РВ	HG
SAMP #	DESCRIPTION							
90941	GREEN BAY FEED	CONC	2.30	0.560	31.7	34.6	40.6	0.880
	1525-2 8/10/00	%REC		í	i		i	i
		DUPL		j	j	İ	j	i i
		CID	01260270	01260270	01260270	01260270	01260270	04650263
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	
90942	GREEN BAY FEED	CONC	2.39	0.599	36.9	1 33.7	46.4	0.836
	1625-2 8/10/00	%REC		i	i	i	i	iiii
		DUPL		j	į	İ	j	i j
		OID	01260270	01260270	01260270	01260270	01260270	04650263
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	
90943	GREEN BAY FEED	CONC	2.50	0.509	36.0	31.4	39.7	0.640
	1715-2 8/10/00	%REC		1	1	1	1	1
		DUPL					!	
		CID	01260270	01260270	01260270	01260270	01260270	04650263
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	
BL#01	METHOD BLANK 01	CONC	<0.200	<0.020	<0.100	<0.100	<0.100	<0.040
		%REC		İ	i	j	İ	i i
		DUPL		1	1		1	i i
		010	01260270	01260270	01260270	01260270	01260270	04650263
				HTUA ADH	HGA AUTH	HGA AUTH	HGA AUTH	
BL#02	LCS 01	CONC	9.18	4.80	21.5	19.7	10.9	0.068
		%REC	91.8	96.0	107.5	98.5	109.0	90.7
		DUPL		ļ	!			
		OID	01260270	01260270	01260270	01260270	01260270	04650263
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	
BL#03	EXTERNAL QC 01	CONC	81.5	36.7	19.3	94.8	1170	0.055
		%REC		I	1	ļ	Ţ	91.7
		DUPL						
		OID	01260270	01260270	01260270	01260270	01260270	04650263

JOB FILE: 90929

DATE: 14 MAR

	ESCRIPTION: GREE ESERVATIVE:	N BAY	- OLIN-ESTES				0054PD-92 SEDIMENT	2310183	RECEIPT DATE: COMPLETION DATE:	
	COLUMN		7	8	9	1	0	11	fŽ	•
	ANALYTE		9	.10	:11	1	3	25	30	
	MG/KG		NI .	SE	AG	Z	K	BA	FE	
SAMP #	DESCRIPTION									1
0929	GREEN BAY	CONC	18.7	0.600	0.400	1	15	76.1	16800	1
	1400-1 8/10/00	XREC	94.4	84.4	96.8	9	4.0	101.6	114.0	1
	OVERFLOW	DUPL	18.3	0.600	0.400	1	15	75.6	16900	Ĺ
		010	01260270	01260270	01260270	je	1260270	01260270	81230271	Ì
			HGA AUTH		HGA AUTH					
90930	GREEN BAY 1505-1 8/10/00 OVERFLOW	CONC XREC DUPL	21.3	0.799   	0.699	.   1	25.	90.0	21100	   
		OID	01260270 HGA AUTH	01260270	) 01260270 HGA AUTH	ĺ	1260270	01260270	01230271	j,
90931	GREEN BAY 1525-1 8/10/00 OVERFLOW	CONC %REC DUPL	15.5	0.498	0.399	S   	4.6	60.7	14700 	]
		OID	01260270 HGA AUTH	01260270	01260270 Hga auth	į	11260270	01260270	01230271	ĺ
90932	GREEN BAY	CONC	19.9	0.700	0.500	1.3	32	88.6	18200	1
	1625-1 8/10/00	%REC		l.	- 1	1			.[	
	OVERFLOW	DUPL	•	, 1	1	1		1	1	
		OLD	01260270	01260270	01260270	į	11260270	01260270	01230271	j.
			HGA AUTH		HGA AUTH					
90933	GREEN BAY	CONC	20.3	0.600	0.500	į t	125	84.0	18900	1
	1715-1 8/10/00	XREC				į.		ļ		
	OVERFLOW	DUPL			4	- 1		!		
		010	01260270	01260270	01260270		11260270	01260270	01230271	-1
			HGA AUTH	,	HGA AUTH					
90934	GREN BAY	CONC	20.7	0.800	0.500	] 1	124	85.9	20400	!
	1400-2 8/10/00	%REC		j	ļ	ļ		1		Į
	DVERFLOW	DABŕ				!				ļ
		OID	01260270 HGA AUTH	01260270	01260270   HGA AUTH	•	1260270	01260270	01230271	!
NI.	Nickel				SE	Selenium	n			
	Silver				ZN ZN	Zinc				
AG BÁ	Siiver Barîum				FE	1 ron				
un.	odi i dili					-1 011				

\* ENVIRONMENTAL CHEMISTRY BRANCH - DATA REPORTING SHEET ( PAGE 4 OF

DATE: 14 MAR L JOB FILE: 90929 JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 21 AUG ( JOB DESCRIPTION: GREEN BAY - OLIN-ESTES COMPLETION DATE: 14 MAR ( TYPE OF SAMPLE: SEDIMENT CHEM. PRESERVATIVE: 11 12 10 COLUMN..... 7 25 30 11 ANALYTE..... 9 FE ZN BA MG/KG..... NI AG SAMP # DESCRIPTION 80.2 17100 0.500 0.699 1 122 90935 GREEN BAY CONC 19.9 XREC 1505-2 8/10/00 OVERFLOW DUPL 010 01260270 01260270 01260270 01260270 01260270 01230271 HGA AUTH HGA AUTH 17300 [ 71.0 1 103 **9**0936 GREEN BAY CONC 17.1 0.498 0.498 1525-2 8/10/00 %REC OVERFLOW DUPL 01230271 01260270 01260270 OID 01260270 01260270 01260270 HGA AUTH HGA AUTH 0.598 134 90.0 19800 0.797 CONC 20.4 90937 GREEN BAY 94.0 91.6 70.0 95.4 1625-2 8/10/00 %REC 90.8 83.0 89.5 19200 DUPL 20.5 0.797 0.598 130 OVERFLOW 01260270 01260270 01260270 01230271 01260270 01260270 OID HGA AUTH HGA AUTH 15800 67.0 0.698 94.8 90938 GREEN BAY CONC 16.0 0.498 1715-2 8/10/00 ZREC OVERFLOW DUPL 01230271 01260270 01260270 01260270 01260270 01260270 D1D HGA AUTH HGA AUTH 0.599 107 77.4 19300 GREEN BAY FEED CONC 18.6 90939 1400-2 8/10/00 %REC DUPL 01260270 01260270 01260270 01260270 01230271 01260270 OID HGA AUTH **HGA AUTH** 80.5 | 61.9 15100 0.400 90940 GREEN BAY FEED CONC 15.2 0.600 XREC 1505-2 8/10/00 DUPL 01260270 01230271 01260270 01260270 01260270 01260270 HGA AUTH HGA AUTH Nickel SE Selenium NI Zinc ZN AG Silver FE Iron 8arium

INE ETTE ONOSO

DATE: 14 MAR

			•	4					
	ESCRIPTION: GREE	N BAY	- OLIN-ESTES		10	B NUMBER: 0054	PD-92310183	RECEIPT DATE:	21 A
CHEM. PR	RESERVATIVE:				TYPE O	F SAMPLE: SEDI	MENT	COMPLETION DATE:	14 M
	COLUMN		7	8	9	10	1.1	12	
	ANALYTE		9	10	11	13	25	30	
	MG/KG		NI	SE	AG	ZN	BA	FE	
SAMP #	DESCRIPTION								
						_		Ÿ	
90941	GREEN BAY FEED	CONC	13.9	0.400	0.300	77.8	50.6	12600	ļ
	1525-2 8/10/00	XREC		ļ	Į.	ļ.	!	[	ļ
		DUPL				ļ	. !		ŀ
		OID	01260270	01260270	01260270		0 0126027	01230271	ı
			NGA AUTH		HGA AUTH				
90942	GREEN BAY FEED	CONC	13.6	0.399	0.399	84.5	57.1	12500	ľ
	1625-2 8/10/00	XREC		i		i ."	i	i	i
		DUPL		i	i .	i	i	i .	i
		OID	01260270	01260270	01260270	0126027	0 01260270	01230271	i
			HGA AUTH	•	HGA AUTH	• • • •	•	•	•
90943	BOCCH BAY FEED	CONC	13.7	1 0.400	1 0.300	76.3	1 56.0	13500	i
YUY43	GREEN BAY FEED	ZREC	13.7	1 0.400	1 0.300	1 1013	1 30.0	1 13300	1
	1715-2 8/10/00	DUPL		ì	ļ	ł	ł	i i	1
*		DUPL	01260270	01260270	   01260270	   0126027	0 0126027	)   01230271	1
		OID	HGA AUTH	1 01500510	HTUA AZH		0   0120021	7 (123021)	4
BL#01	METHOD BLANK 01	CONC	<0.100	<0.200	<0.100	<1.00	<0.100	<1.50	J
		XREC		1	1		1	1	j
		DUPL		1		l i	Į.		
		OID	01260270	01260270	01260270	•	0 0126027	01230271	- 1
			HGA AUTH		HTUA ADH				
BL#02	LCS 01	CONC	20.3	4.00	4.80	42.5	50.6	110	Í
		%REC	101.5	79.8	95.0	85.0	101.2	110.0	í
		DUPL		İ	İ	į	į i	į.	i
		010	01260270	01260270	01260270	0126027	0 01260270	01230271	j
			HGA AUTH		HTUA: ADK		. **		
BL#03	EXTERNAL QC 01	CONC	15.5	1 1.39	4.48	286	194	1 19600	1
921TV3	ENTERIME TO UT	ZREC	,	1	1	i ****	1	1	- 1
		DUPL		1	i	ł		1	-
		OID	01260270	01260270	01260270	0126027	0 0126027	01230271	- 1
			HGA AUTH	1 ALCOSTIA	HGA AUTH	•	1 0,00001	1 0.230211	J <sub>:</sub>
	to a section of				,				
NI	Nickel				SE	Selenium			
AG	Silver				ZH	Zinc			

DATE: 14 MAR ( JOB FILE: 90929 JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 21 AUG ( JOB DESCRIPTION: GREEN BAY - OLIN-ESTES COMPLETION DATE: 14 MAR ( TYPE OF SAMPLE: SEDIMENT CHEM. PRESERVATIVE: 15 COLUMN....... 13 14 ANALYTE..... 31 33 MO MG/KG..... MG R SAMP # DESCRIPTION 0.460 GREEN BAY CONC 20300 410 90929 1400-1 8/10/00 %REC 94.8 99.8 106.2 1 0.400 OVERFLOW DUPL 20300 413 010 01230271 01230271 01230270 CONC 19000 433 90930 1 0.499 GREEN BAY 1505-1 8/10/00 OVERFLOW DUPL 01230270 010 01230271 01230271 CONC 17800 304 0.299 90931 GREEN BAY 1525-1 8/10/00 XREC OVERFLOW 01230271 01230270 010 01230271 359 0.400 CONC 16100 90932 GREEN BAY 1625-1 8/10/00 XREC OVERFLOW DUPL 01230270 [ 01230271 010 01230271 90933 GREEN BAY CONC 17000 372 0.400 1715-1 8/10/00 ZREC OVERFLOW DUPL 010 01230271 01230271 01230270 0.500 CONC 20000 90934 GREN BAY 1400-2 8/10/00 %REC OVERFLOW DUPL 01230270 01230271 010 01230271 MG Magnesium MO Mol ybdenum

	DESCRIPTION: GRE RESERVATIVE:	EN BAY	- OLIN-ESTES		JOB TYPE OF	NUMBER: SAMPLE:	0054PD-92310183 SEDIMENT	RECEIPT DATE: COMPLETION DATE:	
	COLUMN	* * * * *		14	15			ř	
	ANALYTE			32	33				
	MG/KG	******	MG	MN	MO				
AMP #	DESCRIPTION								·J
0935	GREEN BAY	CONC	18900	386	1.0.400				
	1505-2 8/10/00	%REC	10,700	1 200	1.0.400				
	OVERFLOW	DUPL		1	ļ	!			
	OTENI EOR	OID	01230271	1 01070024	04070070	!			
			01230271	01230271	01230270	1			
0936	GREEN BAY	CONC	17900	352	0,299	r			
	1525-2 8/10/00	XREC		i	i	i			
	OVERFLOW	DUPL		i	ì	i			
		OID	01230271	01230271	01230270	Î,			
1937	CAFFU B14		44400	1	•				
1531	GREEN BAY		16100	356	0.398	Į			
	1625-2 8/10/00 OVERFLOW	XREC	92.0	96.8	103.8	ŀ			
	OVERPLOW	DUPL	15600	344	0.398	!			
		010	01230271	01230271	01230270	1.			
938	GREEN BAY	CONC	14300	272	0.399	ď			
	1715-2-8/10/00	%REC		i	1	i			
	OVERFLOW	DUPL		i	i	i			
		DID	01230271	01230271	01230270	)			
1939	GREEN BAY FEED	CONC	18900	376	1.0.499	1			
	1400-2 8/10/00	XREC		j	i	i			
		DUPL		į	i				
		CID	01230271	01230271	01230270	i			
	· · · · · · · · · · · · · · · · · · ·							•	
940	GREEN BAY FEED	CONC	16100	270	1 0.400	1			
	1505-2 8/10/00	%REC			1	í			
		DUPL		·i	i	i			
		DID	01230271	01230271	01230270	i			
								•	

SAMP #	COLUMN ANALYTE MG/KG DESCRIPTION		14 32 MN	15 33			
	MG/KG			33			
		MG	MN				
	DESCRIPTION			<b>M</b> C			
90941							
	GREEN BAY FEED	CONC 15900	260	0.300	1		
	1525-2 8/10/00	<b>XREC</b>	ļ	!	!		
		DUPL 010 012302	 	[   01230270	l I		
		010 012302	71   01230271	1 01530510	ţ.		
90942	GREEN BAY FEED	CONC 12400	253	0.299	1		
	1625-2 8/10/00	*REC		!	ļ		
		DUPL OID 0123027	 71   01230271	01230270	-		
			, , , , , , , , , , , , , , , , , , , ,	,	•		
90943	GREEN BAY FEED	CONC 12700	228	0.300	1		
	1715-2 8/10/00	<b>X</b> REC	i	j	j		
		DUPL			ļ		
		OID 0123027	71 ] 01230271	01230270	ı		
BL#01	METHOD BLANK 01	CONC <10.0	<0.100	<0.100	1		
		%REC	į	j	j		
		DUPL			!		
		OID 0123027	71   01230271	01230270	ı		
BL#02	LCS 01	CONC N/A	20.4	l N/A	ı		
		XREC	102.0	i	i		
		DUPL OID 0123027	 71   01230271	01230270			
		010 0123027	11   01230271	1 01230270	1		
BL#03	EXTERNAL QC 01	CONC 6670	495	1 0.498	ı		
		%REC	į	1	İ		
			 	1 01270270			
		010 0123021	1 01230271	1 01230270	•		
MG	Magnesium			MN M	langanese		
	Molybdenum						
МО							
			•				
			•				
			•				
	Magnesium			01230270	langanese		

4/7/200 1393 FIL	E: 96744 t						*		
*****								DATE:	07 SE
-:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	****	ENVIRONMENTAL	CHEMISTRY BRAN	CH - DATA REPORTI	NG SHEET ( PAGE	1 OF 3 ) ***	*****	****
							•		
	DESCRIPTION: GRI RESERVATIVE:	EN BAY	- OLIN-ESTES		JOB N	UMBER: 0054PD-923		RECEIPT DATE:	21 AU
	NEGENTALIE:				TYPE OF S	AMPLE: SEDIMENT	CON		7 se
	COLUMN			- <b>2</b> :	3	4			
	ANALYTE.			95	100	104			
	MG/KG	*****	TOC	TVS	D&G	TRPH			
SAMP #	DESCRIPTION							ui-	
90944	COTTH DAY	*							
70744	GREEN BAY 1400-1 8/10/00	*REC	37100	<4	240	200	1		
	OVERFLOW	DUPL	39600	!	88.1 	85.8	1		
		OID	60790249	10150235	55990240	55990242	-		
				•	·	•	al .		
90945	GREEN BAY	CONC	50300	44	1.740	1 4-4			
	1505-1 8/10/00	XREC	20000		∶310 	1 230	1	ř	
	OVERFLOW	DUPL	i.	į	j	i	-		
		OID	60790249	10150235	55990240	55990242			
90946	GREEN BAY	CONC	42100	<4	450	1 330	ı		
	1525-1 8/10/00	*REC		Ť			ļ.		
	OVERFLOW	OID	60790249		[	1.	Ě		
		015	00170249	10150235	55990240	55990242	1		
200/7									
90947	GREEN BAY 1625-1 8/10/00	ZREC	50500	<4	530	420	ļ.	¥ 12	•
	OVERFLOW	DUPL			4	1	1		
		OID	60790249	10150235	55990240	55990242	!		
						•			
90948	GREEN BAY	CONC	39400	1 <4	j" <b>57</b> 0	J 450	1		
	1715-1 8/10/00	ZREC		i	1	1	1		
	OVERFLOW	DUPL	20700000	1	1	Ì	i		
		010	60790249	10150235	55990240	55990242	1		
90949	GREEN BAY	4	51200	₹4	360	280	Í		¥, \$
	1400-1 8/10/00 OVERFLOW	XREC DUPL		l ř	ļ		!		
		010	60790249	10150235	55990240	55990242	<b>!</b> F		
					•	,	1		
TOC	Total Organic C	arbon			TVS Tota	l Volatile Solids			
0&G	Oil and Grease					il Recoverable Peti		2005	
							,, 554,	70115	

709 ETF	E: 90944 .							DATE: 07
*****	******	*****	ENVIRONMENTAL	CHEMISTRY BRANC	CH - DATA REPORT	ING SHEET ( PAGE	2 OF 3 3 *****	
								b
JOB CHEM. P	DESCRIPTION: GR RESERVATIVE:	EEN BAY	- OLIN-ESTES			NUMBER: 0054PD-923 SAMPLE: SEDIMENT		ECEIPT DATE: 21 /
	COLUMN			2	3	4		•
	ANALYTE. MG/KG			95 TVS	100 <b>0</b> &G	104		
SAMP #				113	Odd	RPH		
SAMP #	DESCRIPTION							•
90950	GREEN BAY		52500	<4	] 520	410	i	
	1505-2 8/10/00	%REC		ļ.	į	İ	j	
	OVERFLOW	DUPL OID	60790249	10150235	   55990240		!	
		•••	001,7024,	1 10130233	1 33990240	55990242	1	
90951	GREEN BAY	CONC	48600	<4	1 420	320	•	
	1525-2 8/10/00	<b>X</b> REC		1	1	1 320	1	
	OVERFLOW	DUPL		i	İ	i	1	
		OID	60790249	10150235	55990240	55990242	-	
90952	GREEN BAY	CONC	46300	1	1 500	1	_	
	1625-2 8/10/00	%REC	40300	<4	∮ 590 I ∖	460	ļ	
	OVERFLOW	DUPL		i	i	İ	i	
		010	60790249	10150235	55990240	55990242	i	
90953	GREEN BAY	CONC	46800	<4	1.740	1 000		•
	1715-2 8/10/00	%REC	40000	1	360 	280 	ļ	
	OVERFLOW	DUPL		j	`i	i		
		OID	60790249	10150235	55990240	55990242	1	
90954	GREEN BAY FEED	CORC	43000	1 <4	1.740	1		
	1400-2 8/10/00	XREC	45000	`*	) 340 (	Z60 	1	
		DUPL		i	i		, 	
		OID	60790249	10150235	55990240	55990242	İ	
90955	GREEN BAY FEED	CONC	20400	1 4	l pro	1		
	1505-2 8/10/00	XREC	EV400	<4	į 250 I	180	 	
		DUPL		į	i	i		
		010	60790249	10150235	55990240	55990242	l	
toc	Total Organic C	arbon			TVS Tot	al Volatile Solids		
0&G	Oil and Grease					al Recoverable Petr	roleum Hydrocarbor	ns
							,	
							_	
							-	

## INTERNAL QC DATA

Jobfile Number: 90944
Project: GREEN BAY - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 21 AUG 00

			Analyte:		C % SDUPL	RPD	OID
90944	90944 90944	100	O&G	88.1 85.8	93.7	6.2 6.5	55990240 55990242

Page 1

END OF REPORT

• 17

S. FILE: 92099 12/19/10.

DATE: 18 DEC

	ESCRIPTION: GRE	EN BAY	MOBILE HYDROG	CYCLONE-ESTES-OLIÂ		UMBER: NEED PR&C AMPLE: SEDIMENT		RECEIPT DATE:	01 NC
	COLUMN		1	2	3	4	.5	.6	
	ANALYTE		:137	138	139	140	141	142	
	MG/KG	• • • • • •	PCB-1016	PCB-1221	PCB-1232	PCB-1242	PCB-1248	PC8-1254	
SAMP #	DESCRIPTION						1		
92099	GB-METPRO	CONC	<7.96	<b>&lt;7.9</b> 6	<7.96	1 1657	<7.96°	<b>&lt;</b> 7.96	
	ENDER-1	XREC			1	1 (00)	1 -445	1 *1	
	* 1.7° 1.	DUPL			₹.	i i	{	J.	ļ
		010	54920341	54920341	54920341	54920341	54920341	54920341	
				•					
92100	GB/METPRO	CONC	<8.18	<8.18	<8.18	1634	<8.18	<8.18	F
	UNDER-2	%REC	* .	i	i	ĺ		1	i
		DUPL		į	İ	Ï	i	i	i.
		OID	54920341	54920341	54920341	54920341	54920341	54920341	j
2101	GB/METPRO	CONC	<8.29	<8.29	<8.29	8812	<8.29	<8.29	ı
	OVER-1	%REC		i .	į	i `	i	1	i
		DUPŁ		1	ĺ	į	i	i .	i
		.01D	54920341	54920341	54920341	54920341	54920341	54920341	į
	22922	*****		,			•	,	
92102	GB/METPRO		<8.32	<8.32	<8.32	8101	<8.32	<8.32	Į
	OVER-2	%REC		. j		J	!	.   •	Į
		OUPL OID	54920341	E/0707/4					[
		UID	34720341	54920341	54920341	54920341	54920341	54920341	j.
3L#01	METHOD BLANK 01	CONC	<8.3	<8.3	<8.3	1 <8.3	<8,3	<8.3	ľ
		%REC		ĺ	İ	i	i	i	i
		DUPL		Ì	i	i	i	i	i
		OID	54920341	54920341	54920341	54920341	54920341	54920341	i
1:400	1 ma c4	Table (Co.)	4.74	1	r soar f				
L#02	LCS 01	CONC		N/A	N/A	N/A	N/A	N/A	
			102.0			!	ļ	Ţ	- 1
			1.63	L CLOSONIA			1 2.12.25.4	į	ļ
		010	54920341	54920341	54920341	54920341	54920341	54920341	ļ
C8-1016	PC8-1016				PCB-1221 PCB	r-1221			
	PC8-1232				PCB-1242 PCB				
	PCB-1248				PC8-1254 PCB				
	and the second								

JOB	DESCRIPTION: GRI	EEN BAY	HOBILE HYDR	OCYCLONE-ESTES-OLÍN	JOB NUMBER: NEED PR&C : RECEIPT DATE: (	01 NG
CHEM. P	RESERVATIVE:				TYPE OF SAMPLE: SEDIMENT COMPLETION DATE:	18 DE
	COLUMN ANALYTE			8 145	9 146	
			PC8-1260	TCLXYL-S	DCLBP	
SAMP #	DESCRIPTION					
92099	GB-METPRO	CONC	94.9	72.1%	80.1%	
	UNDER-1	*REC		İ		
		DUPL	E/0207/1			
		GID	54920341	54920341	54920341	
92100	GB/METPRO	CONC	87.2	72.3x	78.6%	
	UNDER-2	<b>X</b> REC		İ		
		DUPL	54920341	   54920341	54920341	
				1 21/2024)	27720041	
92101	GB/HETPRO	CONC	526	69.4%	78.8%	
	OVER-1	XREC			j	
		DUPL OID	54920341	54920341	54920341	
	•			1 24/2024	34760341	
92102	GB/METPRO	CONC	490	66.5%	73.9%	
	OVER-2	XREC.		į,	į .	
		DUPL OID	54920341	54920341	54920341	
				1 34720341	J4720J41 }	
BL#01	METHOD BLANK 01	COŃC	<8.3 \·	73.0%	125%	
		XREC		j		
		DUPL	F.(0007) 4		ļ	
		ain	54920341	54920341	54920341 .	
BL#02	LCS 01	CONC	1.62	87.9%	78.4%	
		%REC	97.0	85.8	87.2	
		DUPL		į į	İ	
		OID	<b>5492</b> 0341	54920341	54920341	
PC8-1260	PC8-1260				clXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(40-140 WS	
DCLBP	Decachlorobiphe	nyl(Sur	rogate (40-1	40 WS))		
					*	

## INTERNAL QC DATA

Jobfile Number: 92099
Project: GREEN BAY MOBILE HYDROCYCLONE-ESTES-OLIN
Account Number: NEED PR&C
Date Received: 01 NOV 00

			Analyte			•	SDUPL	RPD	OID
92099	BL#02	137	PCB-1016 PCB-1260	10	2.0	9'	7.6 3.0	4.4	54920341 54920341

Page 1

END OF REPORT

****	*******	**** E	ENVIRONMENTAL	CHEMISTRY BRANCH -	DATA REPORTING	SHEET ( PAGE 1 OF	2)***********	
	8 DESCRIPTION: GREE PRESERVATIVE:	N BAY	MOBILE HYDROC	YCLONE-ESTES-OLIN'		BER: NEED PR&C	RECEIPT DATE: COMPLETION DATE:	
•	COLUMN		1	2	3			
	ANALYTE		<b>8</b> 6	100	104			
	MG/KG	• • • • •	TOC	O&G	TRPH			
SAMP	# DESCRIPTION							
92103	GB/METPRO	CONC	14800	[ 210	120	1		
	UNDER-1	XREC		İ	İ	ļ		
			10400	 	   EE0007/4	1		
		010	60040311	55990346	55990346	1		
92104	GB/MĖTPRO	CONC	8500	200	110	1		
7210-	UNDER-2	%REC	5300		i	i		
		DUPL		1	550007/4	1		
		010	60040311	55990346	55990346	i		
9210	GB/METPRO	CONC	70300	630	390	1		
7210.	OVER-1	%REC	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	i	i	İ		
		DUPL	(00/0711	55990346	   55990346			
		010	60040311	33770345	1 33770340	•		
9210	GB/METPRO	CONC	41000	570	350	1		
	OVER-2	%REC		į	į	!		
		DUPL	60040311	   55990346	55990346	1		
		0.5	00010511	1 22// 22/2	,	•		
BL#0	METHOD BLANK 01	CONC	<100	<35	<35	1		
		XREC		į				
		DUPL	60040311	]   55990346	55990346			
		OID	00040311	1 33770240	1	•		
BL#0	2 LCS 01	CONC	11500	878	873	1		
0		#REC	115.0	88.1	87.6	ļ		
		DUPL 010		   55990346	55990346			
TOC	Total Organic				O&G Oil	and Grease		
TRPH	Total Recovera	ble Pe	troleum Hydro	carbons				

DATE: 11 DEC 1 JOB FILE: 92103 RECEIPT DATE: 01 NOV ( JOB DESCRIPTION: GREEN BAY MOBILE HYDROCYCLONE-ESTES-OLIN JOB NUMBER: NEED PR&C TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 11 DEC | CHEM. PRESERVATIVE: COLUMN...... 1 104 100 ANALYTE..... 86 MG/KG..... TOC 0&6 DESCRIPTION SAMP # EXTERNAL OC 01 CONC 245 %REC 108.9 DUPL 55990346 010 60040311 55990346 Oil and Grease TOC Total Organic Carbon 0&G Total Recoverable Petroleum Hydrocarbons TRPH

## INTERNAL QC DATA

Jobfile Number: 92103
Project: GREEN BAY MOBILE HYDROCYCLONE-ESTES-OLIN
Account Number: NEED PR&C
Date Received: 01 NOV 00

			Analyte		% SDUPL	RPD	OID
92103	BL#02 BL#02	100	O&G	88.1 87.6	88.6 87.8	0.6 0.2	55990346 55990346

Page 1 END OF REPORT

J03 -11	.E: 92107							DATE:	18 JA
*****	*********	*****	ÉNVIRONMENTAL	CHEMISTRY BRANC	CH - DATA REPORT	ING SHEET ( PAGE	1 OF 6) **	*******	****
ing	DESCRIPTION, CO.	TH BAN						•	
CHEM. P	DESCRIPTION: GRE RESERVATIVE:	IAG NO	MOBILE HYDRO	CYCLONE-ESTES-OL	TYPE OF S	IUMBER: NEED PR& AMPLE: SEDIMENT		RECEIPT DATE:	01 NO 18 JA
	COLUMN		1	2	3	4	5	ž	
	ANALYTE		2 .	4	5	6	7	6.	
	MG/KG		A\$	CD	CR	CU	PB	8 HG	
SAMP #	DESCRIPTION							ina	
	*								
92107	GB/METPRO	CONC	<3.0	0.24 1	13.6	13.4	18.6	0.404	
	UNDER - 1	*REC	101.0	96.4	95.5	99.0	86.0	100.4	¦
		DUPL	0.78 J	0.23 1	13.5	13.9	18.9	0.398	- !
		ΟĮΡ	00001008	00001008	00001008	00001008	00001008	04650327	1
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	1	1
92108	GB/METPRO		0.69 J	0.20 1	11.9	13.1	18.4	0.390	ī
	UNDER-2	XREC DUPL		1	į	1	j	1	ľ
	•	DOPL	00001008	l ggögégge		Linite	1	1	į
			OUU IUUD	BOOTOOO   HGA AUTH	00001008 HGA AUTH	1 00001008 HGA AUTH	00001008   HGA AUTH	04650327	1
02100	en autono					IING AVIII	NUA AUIK		
92109	GB/METPRO OVER-1		7.1	2.07	112	120	149	4.98	1
	OfCK- I	XREC DUPL		1	ļ ·	ļ	Ţ	1.	j
		OID	00001008	 	1 00004000			1,	Ì
	; <b>1</b>	,	23001000	00001008   KGA AUTH	1.00001008 HGA AUTH	00001008 HGA AUTH	00001008   HGA AUTH	04650327	. 1
92110	GB/METPRO	CONC	6.8	1.95	1 462			d .	
· · · · · · · · · · · · · · · · · · ·	OVER-2	XREC	2.0	1. 1.55	106	1116	140	4.34	ļ
		DUPL		i	1	- { ·	1. 1 , -	13.76	ļ
		OID	8001000	00001008	00001008	00001008	00001008	4.44	! .
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	04650332	J
BL#01	HETHOD BLANK 01	CONC	<3.0	<0.50	<2.0	0.0	( -2 o	C	
		XREC	2.75	1	~2.0	`c.u	<2.0	<0.040	ļ
		DUPL		i	1	1	1.	5 <u>{</u>	Į
	•		00001008	00001008	00001008	00001008	00001008	- 	-
				HGA AUTH	HGA: AUTH	HGA AUTH	HGA AUTH	04650332	j
BL#02	LCS OT	CONC	9.39	-   5_15	20.6	1 20 7		1.4	
	*	XREC .		103.0	1 103.0	20.3 101.5	10.5	0.0715	1
		DUPL		i	1	101.3	105.0	95.3	ļ.
			00001008	00001008	00001008	00001008	00001008	04650332	- !
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	1 04050332	ļ
ÀS	Arsenic				CD Cad	ការ៉ាប់កា			
CR.	Chromium				CU Cop				
PB	Lead					cury.			
							4		

JOE FILE: 92107 DATE: 18 JAI JOB DESCRIPTION: GREEN BAY MOBILE HYDROCYCLONE-ESTES-OLIN RECEIPT DATE: 01 NOV JOB NUMBER: NEED PR&C CHEM. PRESERVATIVE: TYPE OF SAMPLE: SECIMENT COMPLETION DATE: 18 JAN COLUMN...... 1 ANALYTE..... 2 6 8 MG/KG..... AS CD HG SAMP # DESCRIPTION BL#03 EXTERNAL OC 81 CONC 79.0 33.6 17.6 94.4 952 0.0646 XREC DUPL 010 00001008 00001008 80001008 1 00001008 00001008 04650332 HÇA AUTH HGA AUTH HGA AUTH HGA AUTH Arsenic CD Cadmium CR Chromium CU Copper HG Mercury . 1;

		LE: 92107							DATE:	18 JAN
£	*****	******	*****	ENVIRONMENT	L CHEMISTRY BRANCH	- DATA REPORT	TING SHEET ( PAGE	3 OF 6 )	*******	*****
٠	JOB	DESCRIPTION: GR	FEN DAV	/ MOBILE UVA				•		
	CHEM. P	PRESERVATIVE:	CEN DA	MODILE RISK	OCYCLONE-ESTES-OL 1A	JOB TYPE OF	NUMBER: NEED PR&C SAMPLE: SEDIMENT	<b>:</b>	RECEIPT DATE: COMPLETION DATE:	VON 10
		COLUMN.			8	9	10	ii.	12	
		ANALYTE. MG/KG		.9. NI	10 SE	11	13	25	30	
			•		35	AG	2N	BA	FE	
	SAMP #	DESCRIPTION								ı
	92107	GB/METPRO	CONC	5.4	<4.0	<1.0	l'an e	1		
		UNDER - 1	XREC		94.0	62.6	32.8 95.8	17.8 B	4400	- 1
			DUPL	5.4	<4.0	<1.0	34.0	100.6	1	ŀ
			010	00001008	00001008	D0001008	00001008	17.7 8	4510	į
				HGA AUTH	*.	HGA AUTH	1	1 00001008	00001008	į.
	92108	GB/METPRO	-	4.5	<4.0	<1.0	31.4	16.3 B	3430	
		UNDER-2	XREC DUPL			1	i		3-30.	1
			010	00001008	00001008	00001008	ļ   00001008	00001008	1 00001000	1
				HGA AUTH		HGA AUTH	,	1 2220 1000	00001008	F
	92109	GB/METPRO	CONC	32.2	<4.0	1.4	.  270	149 B	23200	1
		OVER-1	XREC Dupl		1	*	į	į	1 23200	 
			OID	00001008	00001008	00001008	00001008	00001008	Longostopo	į
				HGA AUTH	e de la companya de la companya de la companya de la companya de la companya de la companya de la companya de	HGA AUTH		1 99991000	00001008	i
9	2110	GB/METPRO	CONC	29.5	t 88.0 j	1.4	257	] 141. B	22300	,
		DVER-Z	XREC DUPL				1	İ	1 .	1
			OID	00001008	00001008	00001008	00001008	00001008	00004000	1
				HGA AUTH	•	HGA AUTH	1,	1 44991000	00001008	ì
,8	L#01	METHOD BLANK 01	CONC	<2.0	<4.0	<1.0	<2.0	0.14 J	<24.0	
			XREC DUPL		į		İ	j	; }	
				00001008	00001008	00001008	Locopton	1	Ï	ì
			**	HGA AUTH	,	NGA AUTH	8001000	00001008	00001008	ļ
B	L#02	LCS 01	CONC	20.8	4.7°	3.42	51.8	l re o ÷	9	l l
			XREC	104.0	94.0	68.4	103.6	51.8 8	1110	1
			DUPL				1	103.6	110.0	F
				80010000 HGA AUTH	00001008	80010000 HGA AUTR	00001008	00001008	00001008	1
· Ä)	Í	Nickel							· 3	
A		Silver					enium			
8/		Barium				N Zin E tro				
						E Iro	n			
							•			
					·					

JOB FILE: 92107 DATE: 18 JAN JOB DESCRIPTION: GREEN BAY MOBILE HYDROCYCLONE-ESTES-OLIN JOB NUMBER: NEED PR&C RECEIPT DATE: 01 NOV CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 18 JAN COLUMN..... 7 8 9 10 12 ANALYTE..... 9 10 11 13 25 30 MG/KG..... NI SE AG ZN BA FE SAMP # DESCRIPTION RC BL#03 EXTERNAL QC 01 CONC 13.8 <4.0 0.59 J 272 | 172 B 18900 XREC DUPL 01D 00001008 00001008 00001008 00001008 00001008 00001008 HGA AUTH RGA AUTH NI Nickel SE Selenium AG Silver ZN Zinc Barium Iron

*****	**********	*****	ENVIRONMENTAL (	HEMISTRY BRANCH	- DATA REPO	RTING SHEF	T 1 PAGE	5 OF 6 3	******	DATE:	*****
				1,-14, <del>-</del> 70,0-1		n ing sach	. C FAGE	30, 07	*	~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	******
JOB C	DESCRIPTION: GREE	EN BAY	HOBILE HYDROCY	CLONE-ESTES-OLIN			NEED PRAC		RECEIPT COMPLETION	DATE: DATE:	01 NO
	социян			14							
	ANALYTE			33 MO:							
1.4			rm.	MO.							
SAMP #	DESCRIPTION										
92107	GB/METPRO		83.4	₹2.0	1						
	UNDER-1		103.0 83.3	[   <2.0	1						
		OID	80010000	00001008	1						
			HGA AUTH								
92108	GB/METPRO		78.5	<2.0	Ĵ						
	UNDER-2	XREC DUPL		ļ	1						
		OID	00001008	00001008	j						
			HGA AUTH								
92109	GB/METPRO	CONC	251	1.11 3	j						
	OVER-1	XREC DUPL		.	1 8						
	.•	OID		00001008	1						
	••		HGA AUTH								
92110	GB/METPRO	CONC	243	1.17 J	ļ			-			
	OVER-2	XREC Dupl		<u> </u>					*		
		010	00001008	00001008	i			,			
-			HGA AUTH								
BL#01	METHOD BLANK 01	CONC	<0.80	<2.0	1						
		DUPL		1 	1				÷		٠
		OID	BOOTOOOB HGA AUTH	00001008	Ĭ.						
and made											
BL#02	LES 01	CONC	21.2 106.0	∫ N/A T	1						: • · )
		DUPL		j							
		OID	00001008 HGA AUTH	00001008	Ĺ						
МН	Hamana in .										
	Manganèse				но н	lolybdenum	!				
	•										

	ł					ers at			ļ
	J08- £11,1	E: 92107						DATE:	18 JA'
,	****	******	***** 6	NVIRONMENTAL	CHEMISTRY BRANCH -	DATA REPORTING SHEE	T ( PAGE 6 OF	6 } ***********	*****
		DESCRIPTION: GRE	EN BAY	MOBILE HYDRO	CYCLONE-ESTES-OLIN	JOB NUMBER: TYPE OF SAMPLE:		RECEIPT DATE: (	
		COLUMN ANALYTE MG/XG		32	14 33 HO			CONTRACTOR ONLE	1
	SAMP #	DESCRIPTION							
	BL#03	EXTERNAL QC 01	ZREC DUPL	444 00001008 HGA AUTH	<2.0       00001008	! ! !			
	MN	Manganese				HO Motybdenur	т		
						·			
-514									
=					`				
				ι					
								•	
									• 9
						-			
									·····
						, ,			

*****	*****	**** E	NVIRONMENTAL CI	HEMISTRY BRANCH	- DATA REPORTING	SHEET ( PAGE 1	OF 2) ****	*	********
	SCRIPTION: GREE	N BAY	MOBILE HYDROCY	CLONE-ESTES-OLIN	JOB NUM	BER: NEED PR&C		RECEIPT DATE: PLETION DATE:	
	COLUMN ANALYTE PPB		137.	2 138 PCB-1221	3 139 PCB-1232	4 140 PCB-1242	5 141 PCB-1248	6 142 PC8-1254	
SAMP #	DESCRIPTION					V			RĆ
92111	GB/METPRO UNDER 1	CONC %REC DUPL	<0.24	<0.24 	<0.24	2.65	<0.24 	<0.24   	}   
		OID	54920341	54920341	54920341	54900341	54920341	54920341	
92112	GB/METPRO OVER 1	ZREC	<0.24	<0.24	<0.24	0.43	<0.24	<0.24 	
		DUPL OID	54920341	54920341	54920341	54900341	54920341	54920341	Ì
BL#01	METHOD BLANK OF	%REC	<0.25	( <0.25	<0,25	<0.25	<0.25 	<0.25	  -  -
		OID	54920341	   54920341	54920341	54920341	54920341	54920341	Î
BL#02	LCS OF	%REC	2.42 96.8	] N/A:	∬ n/A. ∐	l nýa	N/A	] N/A.	1
		DUPL	2.39 54920341	   54920341	54920341	54920341	54920341	54920341	j
PCB-1232	PCB-1016 PCB-1232 PCB-1248				PCB-1221 PCB PCB-1242 PCB PCB-1254 PCB	-1242			
			è						

DATE: 12 DEC ( JOB FILE: 92111 RECEIPT DATE: 01 NOV ( .. JOB DESCRIPTION: GREEN BAY HOBILE HYDROCYCLONE-ESTES-OLIN JOB NUMBER: NEED PR&C TYPE OF SAMPLE: WATER COMPLETION DATE: 12 DEC 1 CHEM. PRESERVATIVE: 9 COLUMN...... 7 8 ANALYTE..... 143 145 146 DCLBP TclXYL-S PPB..... PC8-1260 SAMP # DESCRIPTION 65.3% 1 56.5% CONC 0.30 92111 GB/METPRO XREC UNDER 1 DUPL OID 54920341 54920341 54920341 67.3% 64.0% 92112 GB/METPRO CONC <0.24 %REC OVER 1 DUPL 54920341 54920341 CID 54920341 METHOD BLANK 01 CONC <0.25 80.9% BL#01 %REC DUPL 54920341 010 54920341 54920341 79.6% 1 73.0% CONC 2.19 BL#02 LCS 01 %REC 87.6 84.7% 71.2% DUPL 2.24 54920341 54920341 OID 54920341 TotXYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(40-140 WS PCB-1260 PCB-1260 Decachlorobiphenyl(Surrogate (40-140 WS)) DCLBP

## INTERNAL QC DATA

Jobfile Number: 92111
Project: GREEN BAY MOBILE HYDROCYCLONE-ESTES-OLIN
Account Number: NEED PR&C
Date Received: 01 NOV 00

			Analyte		% SDUPL	RPD	OID
92111	BL#02	137	PCB-1016	96.8	95.6	1.2	54920341
92111	BL#02	143	PCB-1260	87.6	89.6	2.3	54920341

Page 1

END OF REPORT

CHEM. PRESERVATIVE: NMOS	d 80k	ESCRIPTION: GREE	YAB K	MOBILE HYDROC	YCLONE-ESTES-OLIN-	JOB	NUMBER: NEED PR&C		RECEIPT DATE:	
ANALYTE	CHEM. PR	ESERVATIVE: HNO3				TYPE OF	SAMPLE: WATER	CO	MPLETION DATE:	26 JAN
SAMP # DESCRIPTION		COLUMN		1	2					
SAMP # DESCRIPTION										
92113		PPM	••••	AS	CD	CR	CU	PB	nu	
UNDER	SAMP #	DESCRIPTION								I
UNDER	92113	GB/METPRO	CONC	<0.015	<0.0025	0.014	] 0.022	0.017	0.00023	1
DUPL   0.0041 J   0.0025   0.014   0.021   0.018   0.00011   0.00011   0.00011002					•	101.0	104.0	103.0	103.6	- 1
OID   OD001002   OD0						:	0.021	0.018	0.00031	- 1
Page   Page					•	•	00001002	00001002	04650340	1
OVER					•	•	•	HGA AUTH		٠
OVER	92114	GB/METPRO	CONC	<0.015	<0.0025	0.005 J	l 0.0088 J	0.012	<0.00020	ļ
BL#01   METHOD BLANK 01   CONC   CO.015   CO.0025   CO.0100   CO.01002   CO.01002   CO.0020		OVER			1	!	!	!	ļ	1
BL#01   METHOD BLANK 01   CONC   CO.015   CO.0025   CO.010   CO.					1				1 0//503/0	ļ
BL#01   METHOD BLANK 01   CONC   <0.015   <0.0025   <0.010   <0.010   <0.010   <0.010   <0.0020			010	00001002	•	•	•	•	04630340	I
Note					HUA AUIE	HGN AUIA	1135 70111			
BUPL   O1D   00001002   00001002   00001002   00001002   00001002   04650340	BL#01	METHOD BLANK 01		<0.015	<0.0025	<0.010	<0.010	<0.010	<0.00020	ļ
BL#02   LCS 01   CONC   1.09   0.538   1.04   1.00   1.07   0.000345						!	1	1	1	1
HGA AUTH				00001007	1 00001003	00001003	1 00001002	1 00001002	04650340	i
NAC   109.0   108.0   104.0   100.0   107.0   92.0			OID	00001002	•		•	•	1 - 3224.0	•
## AS Arsenic CR Chromium   108.0   104.0   100.0   107.0   92.0   109	BL#02	LCS 01	CONC	1.09	0.538	1.04	•			ļ
BL#03 EXTERNAL QC 01 CONC N/A N/A N/A N/A N/A N/A N/A G.0001002 Q.0000001002 Q.00001002 Q.00001002 Q.000001002 Q.000001002 Q.0000000000000000000000000000000000			%REC	109.0	108.0	104.0	100.0	107.0	92.0	į
HGA AUTH					1	1			1 0//507/0	!
BL#03 EXTERNAL QC 01 CONC N/A N/A N/A N/A N/A N/A 0.00043   TREC			CID	00001002	,	•	•	•	04030340	ı
**************************************	O1 40.4	EVTERNAL OF 64	רחויר	N/A		1 N/A	1 N/A	l n/a	0.00043	1
DUPL	BL#03	ENICKMAL GL UI		11/10	""		1	i	j	i
DID 00001002   00001002   00001002   00001002   04650340   HGA AUTH HGA AUTH HGA AUTH HGA AUTH  AS Arsenic CD Cadmium  CR Chromium CU Copper					i	j	j	ļ		1
HGA AUTH HGA AUTH HGA AUTH AS Arsenic CR Chromium CU Copper				00001002	00001002	00001002	00001002	00001002	04650340	ŧ
CR Chromium CU Copper					HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH		
CR Chromium CU Copper	AS	Arsenic				CD	Cadmium			
						CU	Copper			
						HG	Mercury			

5475- 35 tab

JOB	Fèll	F :	921	13

RECEIPT DATE: 01 NOV 1 JOB NUMBER: NEED PR&C JOB DESCRIPTION: GREEN BAY MOBILE HYDROCYCLONE-ESTES-OLIN TYPE OF SAMPLE: WATER COMPLETION DATE: 26 JAN 1 CHEM. PRESERVATIVE: HNO3 11 12 COLUMN...... 7 9 10 13 30 11 10 ANALYTE..... 9 FΕ ZN ВА SE AG SAMP # DESCRIPTION 0.040 0.0518 1.15 <0.005 CONC 0.0044 J <0.020 92113 GB/METPRO XREC 102.0 105.0 105.0 103.0 104.0 105.0 UNDER 0.0518 0.042 1.20 <0.005 DUPL 0.0045 J <0.020 00001002 00001002 010 00001002 00001002 00001002 00001002 HGA AUTH HGA AUTH <0.005 0.036 0.0422 0.520 <0.020 92114 GB/METPRO CONC <0.010 **X**REC OVER DUPL 00001002 00001002 00001002 DID 00001002 00001002 00001002 HGA AUTH HGA AUTH <0.120 <0.0025 METHOD BLANK 01 CONC <0.010 <0.020 <0.005 <0.010 BL#01 ZREC 00001002 00001002 OID 00001002 00001002 00001002 00001002 HGA AUTH HGA AUTH 0.204 1.11 1.01 6.31 CONC - 1.06 1.05 BL#02 LCS 01 101.0 105.0 102.0 111.0 %REC 106.0 105.0 DUPL 00001002 00001002 00001002 010 00001002 00001002 00001002 HGA AUTH HGA AUTH I N/A N/A N/A EXTERNAL QC 01 CONC N/A N/A N/A BL#03 **XREC** DUPL 00001002 1 00001002 00001002 00001002 010 00001002 00001002 HGA AUTH HGA AUTH Selenium Nickel NI. Zinc Silver ZN AG Iron Barium

DATE: 26 JAN JOB F.ILE: 92113 JOB NUMBER: NEED PR&C : JOB DESCRIPTION: GREEN BAY MOBILE HYDROCYCLONE-ESTES-OLIN RECEIPT DATE: 01 NOV COMPLETION DATE: 26 JAN TYPE OF SAMPLE: WATER CHEM. PRESERVATIVE: HN03 COLUMN...... 13 14 ANALYTE..... 32 33 PPM..... MN MO SAMP # DESCRIPTION | 0.010 J CONC 0.0369 92113 GB/METPRO %REC 108.0 UNDER DUPL 0.0372 OID 00001002 00001002 HGA AUTH | 0.0033 J 92114 GB/METPRO CONC 0.0199 %REC OVER DUPL 010 00001002 00001002 HGA AUTH BL#01 METHOD BLANK 01 CONC <0.004 <0.010 %REC DUPL 00001002 010 00001002 HGA AUTH BL#02 LCS 01 CONC 1.06 A/K %REC 106.0 DUPL 010 00001002 00001002 HGA AUTH N/A BL#03 EXTERNAL QC 01 CONC N/A %REC DUPL 010 00001002 00001002 HGA AUTH MO Molybdenum Manganese

HEM. PR	ESERVATIVE:				TYPE	OF SAMPLE:	SEDIMENT		COMPLETION DATE:	9 F
	COLUMN		1	` <b>2</b>	3:	4		5	6.	
	ANALYTE			4	5	6.		7.	8	
	MG/KG		AS	CD	ĊR	CU	Ì	PB	HG	
AMP #	DESCRIPTION									
3019	SAND 1 CELL 4	CONC	0.500	0.050	3.50	3.6	50.   8	3.10	Ĭ 0.040	i
		%REC	0.88	94.0	96.2	98.	.2'   (	0.50	99.2	i
	•	DUPL	0.500	0.050	3.60	3.7	ro ja	3,30.	<0.040	i
		OID	01261032	01261032	0126103	2   012	61032	1261032	04651023	į.
				HGA AUTH	HGA AUTI	HGA	AUTH I	IGA AUTH	•	•
3020 <sup>°</sup>	SAND 2 CELL 4	CONC %REC	0.400	0.030	2.60	16.	5 [13	5.10	<0.040	ľ
		DUPL		ľ	į.	1	ł		-	ļ.
		OID	01261032	01261032	01261032	. 1 012	61032	1261032	04651023	ŀ
				HGA AUTH	HGA AUT	•		IGA AUTH	1.4403,465	. '
1021	SILT/CLAY 1		5.10	1.41	77.6	] 76.	8   1	04	3.44	ì
		XREC		ļ	1	نج المحرب	6:3 1		1, 7	- i
		DUPL		1	44.18	י ער יייקי	$g_{ij} = 1$	炉 シ	13.45	- 1
		OID	01261032	01261032	01261032			1261032	04651023	-1
				HGA AUTH	HGA AUTH	HGA	AUTH .H	GA AUTH	,	
022	SILT/CLAY 2	CONC	5.00	1.30	82.3	73.	7   9	8.4	3.46	Į
		DUPL		-	1					. Į
		OID	01261032	01261032	01261032	1 012	61032   0	1261032	l l 04651023	- !
				HGA AUTH	HGA AUTH	1		GA AUTH	į 04631023	ı
#01	METHOD BLANK 01	CONC	<0.200	<0.020	<0.100	<0.	100 J <	0.100	<0.040	1
		%REC		i	i	i	i		1 10.000	H
		DUPL		Ì	i	i	i		i	i
		OID	01261032	01261032	01261032	012	51032   0	1261032	04651023	į
				HGA AUTH	HGA AUTH	HGA	H RTUA	GA AUTH	•	•.
#02	LCS 01	CONC	8.70	4.69	18.9	] 20.0	9 .   9	.70	0.0699	1
		%REC	87.2	93.8	94.5	100.	.0 9	7.1	93.2	i
		DUPL		1	1	J	ĺ		Ĭ.	i
		010	01261032	01261032	01261032	0126	•	1261032	04651023	j
				HGA AUTH	HGA AUTH	HĠA	AUTH H	GA AUTH		
	Arsenic				CD	Cadmium				
	Chromium				CU	Copper				
	Lead				HG	Mercury				

\*\*\*\*\*\*\* ENVIRONMENTAL CHEMISTRY BRANCH - DATA REPORTING SHEET ( PAGE 1 OF

. : . JOB FILE: 93019 DATE: 09 FEB : JOB DESCRIPTION: GREEN BAY - OLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 20 DEC 1 . CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 9 FEB ( COLUMN..... 1 2 ANALYTE..... 2 6 8 MG/KG..... AS CD CR CU ₽B НG SAMP # DESCRIPTION RC 8L#03 EXTERNAL QC 01 CONC 83.5 37.1 17.5 92.0 1180 0.0537 %REC DUPL OID 01261032 01261032 01261032 01261032 01261032 04651023 HGA AUTH HTUA ADH HGA AUTH HGA AUTH AS Arsenic CD Cadnatum Chromium CR CU Copper PR Lead HG Mercury

JOB FILE: 93019

DATE: 09 FEB 1

93019 SAND 1 CELL 4 CONC 1.90		DESCRIPTION: GREE RESERVATIVE:	H BAY	- OLIN-ESTES			DB NUMBER: 0054 DF SAMPLE: SED1		RECEIPT DATE: COMPLETION DATE:	
MG/KG   NI   SE   AG   ZN   BA   MN	•	COLUMN		7	8	9	10	11	12	
93019 SAND 1 CELL 4 CONC 1.90   <0.200   0.300   15.2   5.30   47.7   90.8   87.0   106.6   117.0   40.200   0.200   15.5   5.50   46.7   47.7   90.8   87.0   106.6   117.0   40.200   0.200   15.5   5.50   46.7   47.7		ANALYTE		9	10	.11	13	25	32	
93019 SAND 1 CELL 4 CONC 1.90		MG/KG		.NI	SE	AG	ZN	ВА	HN	
278   278	SAMP #	DESCRIPTION								
DUPL 1.90	93019	SAND 1 CELL 4	CONC	1.90	<0.200	0.300	15.2	5.30	47.7	
93020 SAND 2 CELL 4 CONC 2.50			%REC	95.8	87.2	90.8	87.0	106.6	117.0	
93020 SAND 2 CELL 4 CONC 2.50			DUPL	1.90	<0.200	0.200	15.5	j 5.50	•	
93020 SAND 2 CELL 4 CONC 2.50			5 2			•				
TAREC   DUPL   OID 01261032   O					1 'ataining		1	- ,		
DUPL   OID   01261032   0126103	93,020	SAND 2 CELL 4		2.50	<0.200	0.500	11.8	3.90	1 40.8	
93021 SILT/CLAY 1 CONC 26.6   1.20   0.799   3.11   102   325   325   326   32						l	1	•		
HGA AUTH				01241072	1 01341073	1 01241073	1 0126103	) )	1 01361073	
Nethod Blank 01   Conc   40.100   Conc   C			OID		1 01201032	A 1 1	•	2   01201032		
### PROPRIES   1.00   1.00   294   107   326   3	93021	SÍLT/CLAY 1	CONC	26.6	1 1,20	0.799	3.11	102	325	
OID 01261032   0126103		:	ZREC		i.	1	İ	Ĺ	1	
OID 01261032   0126103			DUPL	1331	1 1A.	1 2 10	İ	ĺ	1330	
93022 SILT/CLAY 2 CONC 27.6   1.00   1.00   294   107   326						01261032	0126103	2 01261032	01261032	
93022 SILT/CLAY 2 CONC 27.6   1.00   1.00   294   107   326					•	HGA AUTI	1 116.6	2 1045	HGA AUTH	
DUPL OID 01261032   01	93022	SILT/CLAY 2	CONC	27.6	1.00	1.00			326	
DID   01261032   012			ZREC		1	1	1	1	l	
HGA AUTH  HGA AUTH			DUPL		,	Ì	İ	Ï	Ï	
BL#01 METHOD BLANK 01 CONC <0.100   <0.200   <0.100   <1.00   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.100   <0.1			OID	01261032	01261032	01261032	0126103	2 01261032	01261032	
### ### ### ### ### #### #### ########				HGA AUTH	•	HGA AUTI	1		HGA AUTH	
DUPL OID 01261032   01	BL#01	METHOD BLANK 01	CONC	<0'.100	<0.200	<0.100	<1.00	<0.100	<0.100	
OID 01261032			%REC		i	i	į	i	i	
HGA AUTH  HGA AUTH			DUPL		i	i	i	i	· j	
BL#02 LCS 01 CONC 19.4			OID	01261032	01261032	01261032	0126103	2 01261032	01261032	
MREC 97.0 83.6 90.6 69.2 88.0 96.0  DUPL				HGA AUTH	•	HGA AUTI	1		HGA AUTH	
MREC 97.0 83.6 90.6 69.2 88.0 96.0  DUPL	BL#02	LCS 01	CONC	19.4	4.20	4.50	44_6	44.0	19.2	
DUPL			%REC	97.0	83.6	90.6	69.2	88.0	96.0	
OID 01261032 01261032 01261032 01261032 01261032 01261032 01261032 01261032 01261032			5. 1.	1.	1	1	i	i	i .	
HGA AUTH HGA AUTH HGA AUTH				01261032	01261032	01261032	0126103	2 01261032	01261032	
NI Nickel SE Selenium					Latesiasis	•		.   1.25,052		
	NI.	Nickel				SE	Selenium			
AG Silver ZN Zinc	AG									

JOB FILE: 93019 JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 20 DEC 00 JOB DESCRIPTION: GREEN BAY - OLIN-ESTES TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 9 FEB 01 CHEM. PRESERVATIVE: COLUMN...... 7 8 10 12 32 13 25 ANALYTE..... 9 10 11 MG/KG..... NI ZN BA ROW SAMP # DESCRIPTION 329 175 533 EXTERNAL QC 01 CONC 14.3 4.09 XREC DUPL 01261032 01261032 01261032 01261032 010 01261032 01261032 HGA AUTH HGA AUTH HGA AUTH SE Selenium Hickel Silver Zinc AG Manganese Barium

156

```
DATE: 09 FEB (
JOB FILE: 93019
RECEIPT DATE: 20 DEC C
                                                  JOB NUMBER: 0054PD-92310183
  JOB DESCRIPTION: GREEN BAY - OLIN-ESTES
CHEM. PRESERVATIVE:
                                                TYPE OF SAMPLE: SEDIMENT
                                                                            COMPLETION DATE: 9 FEB C
          ANALYTE..... 33
          MG/KG..... MO
SAMP # DESCRIPTION
                                                                                              RC
      SAND 1 CELL 4 CONC <0.100
93019
                   XREC 98.4
                  DUPL <0.100
                   OID 01261032
93020
      SAND 2 CELL 4
                  CONC <0.100
                   %REC
                   DUPL
                  010 01261032
93021
     SILT/CLAY 1
                  CONC 0.799
                   XREC
                   DUPL
                   OID 01261032
93022
      SILT/CLAY 2
                  CONC 0.899
                   XREC
                   DUPL
                   DID 01261032
Bì.#01
      METHOD BLANK 01 CONC <0.100
                   ZREC
                   DUPL
                   OID 01261032
                   CONC 5.00
BL#02
     LCS 01
                  %REC 100.2
                   DUPL
                   010 01261032
MO
       Malybdenum
                                                                                             7.5
```

DATE: 09 FEB ( JOS FILE: 93019 JOB DESCRIPTION: GREEN BAY - CLIN-ESTES JOB NUMBER: C054PD-92310183 RECEIPT DATE: 20 DEC C
HEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 9 FEB C CHEM. PRESERVATIVE: MG/KG..... MO RC SAMP # DESCRIPTION BL#03 EXTERNAL QC 01 CONC 0.698 %REC DUPL OID 01261032 MC Motybdenum

Mg 1-2501

JOB FILE: 93023

DATE: 24 JAN

	SCRIPTION: GREE	N BAY	- OLIN-ESTES			MBER: 0054PD-92 MPLE: SEDIMENT		RECEIPT DATE: 7	
	COLUMN			2 138	3 <sup>-</sup> 139	4 140	5 141	6 142	
	UG/KG		A STATE OF THE STA	PCB-1221	PCB-1232	PCB-1242	PC8-1248	PCB-1254	
SAMP #	DESCRIPTION								
3023	SAND 1 CELL 4	CONC	<10.3	<10.3	<10.3	365	<10.3	<10.3	.1
		XREC DUPL	42.8		1.	] 		1	
			54821012	54921012	54821012	54821012	54821023	54821012	i
						たいか			
3024	SAND 2 CELL 4	CONC XREC DUPL	⊰10.3	<10.3	<10.3	523	<10.3 	<10.3 	1
	·	OID	54821012	54921012	54821012	54821012	54821023	54821012	j
3025	SILT/CLAY 1	CONC	<38.1	l <38.1	<38.1	6052	<b>&lt;</b> 38 <sub>*</sub> 1	<b>&lt;38.</b> 1	1
·3023	SILI/CLAT	ZREC DUPL	~50, t			1	):	Î	1
		OID	54821012	54921012	54821012	54821012	54821023	54821012	J
3026	SILT/CLAY Z		₹39.7	<39,7	₹39.7	5803	<39.7	<39.7	!
		XREC DUPL		1			1		1
		OID	54821012	54921012	54821012	54821012	54821023	54821012	I
3L#01	METHOD BLANK 01	CONC	<8.33	<8.33	<8.33	<8.33 	<8.33	-   ≪8.33 	1
		DUPL	54821012	54921012	54821012	)   54821012	54821023	   54821012	1
BL#02	LCS 01	CONC XREC		N/A 	N/A 	N/A 	N/A	N/A	ļ
		DUPL 010	54821012	   54921012	   54821012	   54821012	54821023	54821012	
مرسد دد.	5.055833								
	PCB-1016 PCB-1232				PCB-1221 PCI PCB-1242 PCI				
	PCB-1248				PCB-1254 PCI				

	DESCRIPTION: GREE	N BAY	- OLIN-ESTES		JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 20 DE
CHEM. P	RESERVATIVE:				TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 24 JA
	COLUMN ANALYTE UG/XG		143	8 145 Tolxyl-s	9 146 DCLBP
SAMP #	DESCRIPTION				
93023	SAND 1 CELL 4	%REC DUPL	14.1 103.6	79.4% 81.4	88.8%     84.1   
			54821012	54821012	54821012
93024	SAND 2 CELL 4		28.7	83.1%	90.1%   
		DID	54821012	54821012	54821012
<b>93</b> 025	SILT/CLAY 1	CONC %REC	319	78.3%	89.2%   
		DUPL OID	54821012	54821012	54821012
93026	SILT/CLAY 2	CONC XREC DUPL	316	71.8X   	84.9%
		010	54821012	54821012	54821012
BL#01	METHOD BLANK 01	CONC %REC DUPL	<8.33	86.2% 	73.7%   
		OID	54821012	54821012	54821012
BL#02	LCS 01	%REC	0.75 90.4	87.0%	74.9%   
		OID	54821012	54821012	54821012
PCB-126	0 PC8-1260 Decachlorobiphe	enyl (Su	rrogate (40-	140 WS>>	TolxYL-S 2,4,5,6-Tetrachloro-m-xylene(Surrogate(40-140 WS

Jobfile Number: 93023

Project: GREEN BAY - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 20 DEC 00

• • • • • • • • • • • • • • • • • • • •	-		Analyte		% SDUPL	RPD	OID
93023	93023	137	PCB-1016	42.8	60.4	34.1	54821012
93023	93023	143	PCB-1260	103.6	100.4	3.1	54821012
93023	93023	145	TclXYL-S	81.4	88.8	8.7	54821012
93023	93023	146	DCLBP	84.1	87.5	4.0	54821012

Page 1

JOS FILE: 93027 DATE: 16 JAI JOB DESCRIPTION: GREEN BAY - DLIN-ESTES JOB NUMBER: 0054PD-92310183 RECEIPT DATE: 20 DEC CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 16 JAN COLUMN...... 1 ANALYTE..... 86 100 MG/KG..... TOC O&G TRPH SAMP # DESCRIPTION 93027 SAND 1 CELL 4 CONC 1610 | 19 J 56 **XREC** DUPL 1980 OID 60041010 55991014 55991014 93028 SAND 2 CELL 4 CONC 1260 30 2 J %REC 87.6 88.8 DUPL DID 60041010 55991014 55991014 93029 SILT/CLAY 1 CONC 14200 370 200 %REC DUPL OID 60041010 55991014 55991014 93030 SILT/CLAY 2 CONC 28000 580 340 XREC DUPL 55991014 OID 60041010 55991014 METHOD BLANK 01 CONC <100 BL#01 <35 <35 XREC DUPL 55991014 OID 60041010 55991014 BL#02 883 LCS 01 CONC 11500 883 %REC 115.0 88.6 88.6 DUPL OID 60041010 ' 55991014 TOC Total Organic Carbon 0&G Oil and Grease TRPH Total Recoverable Petroleum Hydrocarbons

J23 FILE: 93027 DATE: 16 JA JOB DESCRIPTION: GREEN BAY - OLIN-ESTES RECEIPT DATE: 20 DE JOB NUMBER: 0054P0-92310183 CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 16 JA COLUMN..... ANALYTE..... 86 104 MG/KG..... TOC O&G TRPH DESCRIPTION BL#03 EXTERNAL QC 01 CONC 21750 %REC 96.7 010 60041010 55991014 55991014 TOC Total Organic Carbon Oil and Grease TRPH Total Recoverable Petroleum Hydrocarbons

Jobfile Number: 93027
Project: GREEN BAY - OLIN-ESTES
Account Number: 0054PD-92310183
Date Received: 20 DEC 00

		-
93027 93028 100 O&G 87.6 89.2 1.8 93027 93028 104 TRPH 88.8 89.0 0.2	55991014 55991014	

Page 1

CHEM. P	DESCRIPTION: GR RESERVATIVE:		r - OLIN-ESTES	<b>S</b>	TYPE OF S	NUMBER: 00549D-9 SAMPLE: SEDIMENT		RECEIPT DATE:	16 MAI 7 JUI
16-12	COLUMN	• • • • • •	1	2	3	4	5	6	
70 N	O ANALYTE.	,,,,,,	2	4	<b>5</b> ;	6	7	8	
O,	MG/KG	• • • • • •	AS	ĆD	CR	CU	PB	НG	
SAMP #	DESCRIPTION								
94937	CLAY 1 CELL 4	CONC	6:90	2.29					
	3/16/01	ZREC			140	118	191	3.30	- 1
	=•	DUPL	: -	99.6	79.6	79.6	110.0		i
		DID	197	2.32	140	118	1.95	i	j
		Oib	01261137	01261137	01261137	01261137	01261137	04651102	- 1
				HGA AUTH	HGA AUTH	HGA AUTH	HGA AUTH	,	'
94938	CLAY 2 CELL 4	CONC	6.79	2.28	1 128	1 108	1 196	Laka	
	3/16/01	ZREC		Í	i *	1	1 190	2.40	ļ
		DUPL		į.	1	i	l i	1	Ì
		010	01261137	01261137	01261137	01261137	1 04044475	!	1
				HGA AUTH	HGA AUTH	HGA AUTH	01261137	04651102	- [
<b>.</b>					HEA ACTI	NGA ROTA	HGA AUTH		
4939	SILT CELL 4	CONC	2.00	0.320	l 15.1	21.2	242	ï o aza	
	3/16/01	%REC			- 1	1	1 546	0.363	. !
		DUPL		j	i		ļ .	109:2	ļ
		OID:	01261137	01261137	01261137	01261137	1.04744477	0.371	
				HGA AUTH	HGA AUTH	HGA AUTH	01261137	04651102	ı
					WON NOTE	NAN AUT	HGA AUTH		
BL#01	METHOD BLANK 01	CONC	<0.200	<0.020	i <0.100	<0.100	<0.100	1 -0 0400	
		<b>XREC</b>		1	, i	1	1 10.100	<0.0100°	!
		DUPL		Ì	i	i	ļ		1 .
		OID	01261137	01261137	01261137	01261137	Lossons	1	ļ
				HGA AUTH	HGA AUTH	•	01261137	04651102	
						HGA AUTH	HGA AUTH		
L#02	LCS 01	CONC	10.2	1 51.4	19.1	18.9	100		
		XREC.	102.0	102_8	95.5	1 94.5	9.60	0.0992	- 1
		DUPL		1	1 73.3	74-3	96.3	99.2	1
		OID	01261137	01261137	01261137	1.0124422		1	. I
			· ; · <del>, ·</del> ·	HGA AUTH	***	01261137	01261137	04651102	.1
				HOA AUIR	HGA AUTH	HGA AUTH	HGA AUTH		
L#03	EXTERNAL OC 01	CONC.	96.3	1-40.2	22.1	1 101	l enno		• 1
		ZREC		1	1	1 101	1090	0.0650	1 '
		DUPL		i	; <b>)</b> 	I I	1.	108.3	1
			01261137	01261137	01261137	1 01244477	1.	Ţ	
				HGA AUTH	• .	01261137	01261137	04651102	- 1
				ina viniti	HGA AUTH	HGA AUTH	HGA AUTH		
S	Arsenic				CD Cade				
R '	Chromium								
8	Lead				CU Copp HG Merc	per			

	100	ESCRIPTION: GRE	EN BAY	- OLIN-ESTES		JOB N	UMBER: 005490-9	2310183	RECEIPT DATE:	16 MA
С	HEM. PR	ESERVATIVE:				TYPE OF S.			COMPLETION DATE:	7 JU
		COLUMN			8	9	10	11	12	
		ANALYTE MG/KG		9 NI	10 SE	11 AG	13 Zn	24 AL	25 Ba	
Ş.	AMP #	DESCRIPTION					<del></del>	AL .	DA.	
9	4937	CLAY 1 CELL 4		38.7	1.30	1.50	689	26500	184	1
		3/16/01		87.4	88.2	98.2	79.4	90.8	110.4	- 1
			DUPL	38,7	1.30	1.60	692	26400	186	
			OID	01261137 HGA AUTH	01261137	01261137 HGA AUTH	01261137	01231154	01261137	1
94	4938	CLAY 2 CELL 4	CONC	35.0	1.30	1.60	672	26400	l 182	ı
		3/16/01	XREC		į	į	į	į		i
			DUPL	01261137	   01261137	1 040/4477	1 010/4477			- 1
			0.0	HGA AUTH	1 0125/137	01261137   HGA AUTH	01261137	01231154	01261137	!
94	4939	SILT CELL 4		7.00	0.300	0.400	320	1940	27.5	1
		3/16/01	XREC		1	į `	Ţ	1	ĺ	i
			DUPL	010/1177	1		!	ļ		1
			010	01261137 HGA AUTH	01261137	01261137 HGA AUTH	01261137	01231154	01261137	.
BL	#01	METHOD BLANK 01	CONC	<0.100	<0.200	<0.100	1.20	<2.00	<0.100	- 1
			XREC		!	1	!	į	į	i
			DUPL OID	01261137	   01261137	1 01341177	1 012/1127	01374451		Ţ
			0.0	HGA AUTH	1 01201137	01261137 HGA AUTH	01261137	01231154	01261137	i
BL	#02	LCS 01	CONC	18.3	4.30	4.80	45.7	N/A	53.4	,
			TREC	91.5	86.8	96.0	91.4		106.8	- 1
			DUPL		i	i	i	i	1 100.0	
			OID	01261137 HGA AUTH	01261137	01261137 HGA AUTH	01261137	01231154	01261137	i
BL	#03	EXTERNAL QC 01	CONC	16.4	1.60	4.79	j 331	33000	1 244	1
			%REC		1,120	1	1 33.	33000	216	i I
			DUPL		j	İ	j	i	i	i
			DID	01261137 HGA AUTH	01261137	01261137 HGA AUTH	01261137	01231154	01261137	i
N1		Nickel					enium			
AG AL		Silver Aluminum				ZN Zin				
,,,		Atampon				BA Bar	ium			

	ESCRIPTION: GREE ESERVATIVE:	N; BAY	- OLIN-ESTES			MBER: 005490-92 AMPLE: SECIMENT		RECEIPT DATE: COMPLETION DATE:	
	COLUMN ANALYTE UG/KG	• • • • •		2 138 PCB-1221	3 139 PCB-1232	4 140 PCB-1242	5 141 PCB-1248	6 142 PCB-1254	
SAMP #	DESCRIPTION								
94940	CLAY 1 CELL 4 3/16/01	CONC %REC DUPL	<40.5	<40.5 	<40.5   	<b>6</b> 860   	<40.5   	<40.5 	
		010	54831099	54831099	54831099	54831099	54831099	54831099	1
94941	CLAY 2 CELL 4 3/16/01	<b>X</b> REC	<40.5	<40.5 	<40.5 	8330 	<40.5 	<40.5	
		DUPL OID	54831099	54831099	54831099	54831099	54831099	54831099	
94942	SILT CELL 4 3/16/01	CONC %REC DUPL	<11.2	<11.2 	<11.2 	1950 	<11.2 	<11.2 	
		OID	54831099	54831099	54831099	54831099	54831099	54831099	i
BL#01	METHOD BLANK 01	CONC %REC DUPL	<8.3	<8.3	<8.3 	<8.3 	<8.3 	<8.3 	
		OID	54831099	54831099	54831099	54831099	54831099	54831099	ļ
BL#02		CONC	93.2	N/A 	N/A 	N/A 	N/A	[ N/A [	] !
		DUPL OID	54831099	54831099	54831099	54831099	54831099	54831099	ļ
PCB-1232	PCB-1016 PCB-1232 PCB-1248				PCB-1221 PCB PCB-1242 PCB PCB-1254 PCB	- 1242			

	DESCRIPTION: GRE RESERVATIVE:	EN BAY	- OLIN-ESTES		JOB NUMBER TYPE OF SAMPLE		RECEIPT DATE: COMPLETION DATE:	16 MAR 25 APR
	COLÚMN		7	8	· <b>9</b>			
	ANALYTE		143	145	146			
	UG/KG		PEB-1260	TCLXYL-S	DCLBP	•		
SAMP #	DESCRIPTION							. R
94940	CLAY 1 CELL 4	CONC	240	114%	130%			
	3/16/01	ZREC.		İ	i i			
		DUPL		i	i i			
		OID	54831099	54831099	54831099			
949 <u>4</u> 1	CLAY 2 CELL 4	cond	236	Laizn	Lagry			
4741	3/16/01	CONC	, 230	116%	115%			
	.5/10/01	DUPL						
		OID	54831099	54831099	54831099			
	ė.							
4942	SILT CELL 4	CONC	18.2	95.2%	117%			
	3/16/01	%REC		1	1 1			
		DUPL			] ]			
		OID	54831099	54831099	54831099			
L#01	METHOD BLANK D1	dova	<8.3	Leony	Lagina 6			
LFU	METHOD BEARK DI	CONC %REC	NO. J	109%	127%			
		DUPL		Į į	1 1			
		DID	54831099	54831099	54831099			
			¥102107,	1 24021055	1 24021033			
. iinn					i			
L#02	LCS 01	CONC	75.3	99.1%	114%			
		%REC	90.4	104	113			
		DUPL OID	81.3	F/971000				
		-010	54831099	54831099	54831099			

DCLBP

Jobfile Number: 94940
Project: GREEN BAY - OLIN-ESTES
Account Number: 00549D-92310183
Date Received: 16 MAR 01

Job#	Sample	Tst	Analyte	% R	REC	કૃ	SDUPL	RPD	OID
94940	BL#02	137	PCB-1016	93.	. 2	10	3.2	10.2	54831099
94940	BL#02	143	PCB-1260	90.	. 4	97	7.6	7.7	54831099

Page 1

JOB FILE: 94943 DATE: 30 APR C \*\*\*\*\*\*\* ENVIRONMENTAL CHEMISTRY BRANCH - DATA REPORTING SHEET ( PAGE 1 OF 1 ) \* JOB DESCRIPTION: GREEN BAY - CLIN-ESTES JOB NUMBER: 005490-92310183 RECEIPT DATE: 16 MAR C CHEM. PRESERVATIVE: TYPE OF SAMPLE: SEDIMENT COMPLETION DATE: 30 APR 0 COLUMN..... 1 ANALYTE...... 86 100 104 900 MG/KG..... TOC 0&G TRPH O&G-RR DESCRIPTION RC 94943 CLAY 1 CELL 4 CONC 81000 540 230 #1 390 3/16/01 %REC DUPL 82500 010 60041117 55991107 55991110 55991110 94944 CLAY 2 CELL 4 CONC 76800 1:460 130 #1 250 3/16/01: **XREC** DUPL OID 60041117 55991110 55991107 94945 SILT CELL 4 CONC 9180 46 #1 110 3/16/01 %REC DUPL OID 60041117 55991107 55991110 55991110 METHOD BLANK 01 CONC <100 1 <35 <35 #11 <35 %REC DUPL 55991107 010 60041117 55991110 55991110 BL#02 LCS 01 CONC 11200 910 927 #1 921 %REC 112.0 88.9 90.5 1 89.9 DUPL OID 60041117 55991107 55991110 55991110 BL#03 EXTERNAL QC 01 CONC N/A N/A N/A I NZA %REC DUPL 010 60041117 55991107 55991110 55991110 TOC Total Organic Carbon 0&G Oil and Grease TRPH Total Recoverable Petroleum Hydrocarbons O&G-RR Oil & Grease (Repeat) FOOTNOTES: #1 Repeat value, extracts 4/18/01 - See Corrective Action Form.

Jobfile Number: 94943
Project: GREEN BAY - OLIN-ESTES
Account Number: 00549D-92310183.
Date Received: 16 MAR 01

Job#	Sample	Tst	Analyte	왉	REC	ક	SDUPL	RPD	OID
	- <b></b> -								
94943	BL#02	104	TRPH	90	0.5	8	7.4	3.5	55991110

Page 1

nalysis:	O&G, TRPH		Date:	23-April-01	
nalyst:	Harrison		Instrument:	FTIR	
roblem:	Samples extracted 3/ blank and in samples probably from silica	s. TRPH numbers hi			
ample Nur	nber(s) Affected:	94943-94945			
ecommen	ded Corrective Action;	Pre-clean silica ge	l and re-extract sa	mples	
		,			
orrective A	Action Taken By Analyst:	Samples re-extrac receipt on 3/16. Si			mple
comments:	No contamination wi lower than original v between extractions TRPH data ONLY is	ralues. Possibly sor . Both original and	ne analyte loss di	ue to length of time	
Date Correct Reviewed t	ctive Action Taken:	18-April-01			

#### REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS

display a currently valid OMB control number. PLEASE	DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.	ity for failing to compry with a confection of thornation in traces not
1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (From - To)
October 2002	Final report	
4. TITLE AND SUBTITLE		5a. CONTRACT NUMBER
Soil Separation Mobile Treatme	ent Plant Demonstration, Bayport Confined	
Disposal Facility, Green Bay, V	· · · · · · · · · · · · · · · · · · ·	5b. GRANT NUMBER
Disposar racinty, Green Bay, v	VISCOLISITI	
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)		5d. PROJECT NUMBER
Trudy I Olin Estes Susan E D	Bailey, David W. Bowman, Dennis L. Brandon	
Trudy J. Offil-Estes, Susan E. B	dancy, David W. Bowillan, Dennis L. Brandon	5e. TASK NUMBER
·		
		5f. WORK UNIT NUMBER
		0054PD
7. PERFORMING ORGANIZATION NAMI	E(S) AND ADDRESS(ES)	8. PERFORMING ORGANIZATION REPORT NUMBER
U.S. Army Engineer Research and Do	evelopment U.S. Army Engineer District, Detroit	NUMBER
Center	McNamara Federal Building	EDDC/EL TD 02 29
Environmental Laboratory	477 Michigan Avenue	ERDC/EL TR-02-38
3909 Halls Ferry Road	Detroit, MI 48226-2575	
Vicksburg, MS 39180-6199	Denoit, wii 48220-2373	
	OV HARE(O) AND ADDRESS (EQ.	40 SPONSOD/MONITORIS ACRONIVACO
9. SPONSORING / MONITORING AGENC	CT NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
U.S. Army Corps of Engineers		
Washington, DC 20314-1000		11. SPONSOR/MONITOR'S REPORT
		NUMBER(S)
		·
12. DISTRIBUTION / AVAILABILITY STA	TEMENT	
Approved for public release; distribut	tion is unlimited	
Approved for public release, distribut	tion is unminited.	
40 CURRI FHENTARY NOTES		
13. SUPPLEMENTARY NOTES		
•		•
14. ABSTRACT		
	density separator (MDS) was tested in a 1-day demons	tration conducted at the Daymort Confined
	The objective of the demonstration was to evaluate the	
	with respect to fines content and PCBs concentration.	
excavating and preparing the material	I for processing with the MDS were tested. One phase	of an ongoing effort in evaluating the
	for volume reduction of dredged material, the field de	

A mobile, self-contained, maximum density separator (MDS) was tested in a 1-day demonstration conducted at the Bayport Confined Disposal Facility in Green Bay, WI. The objective of the demonstration was to evaluate the ability of the equipment to separate a sand fraction meeting a given specification with respect to fines content and PCBs concentration. Additionally, two different methods of excavating and preparing the material for processing with the MDS were tested. One phase of an ongoing effort in evaluating the feasibility of soil washing techniques for volume reduction of dredged material, the field demonstration was preceded by bench-scale fractionation studies. These studies were conducted to determine the magnitude and distribution of contaminants in the material to be processed, and expected contaminant levels in the product streams. The demonstration was the culmination of research into the implementation and interpretation of fractionation studies; type, availability, and suitability of off-the-shelf equipment for sediment processing; and site visits to view different physical separation plant configurations. The results of these cumulative efforts will ultimately be incorporated into summary guidance documents.

15. SUBJECT TERMSHydrocycloneDredged materialMaximum density separatorFractionation studiesMDS				s ments separation	Soil washing Volume reduction
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			19b. TELEPHONE NUMBER (include
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED		229	area code)